JOURNAL

OF THE

Royal United Service Institution

PUBLISHED UNDER THE AUTHORITY OF THE COUNCIL.

Editor - Captain H. GARBETT, R.N. (Retired).

Vol. XLIII.—15th FEBRUARY, 1899.—No. 252.

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J. J. KELIHER & CO., 22, CHARING CROSS, S.W.,
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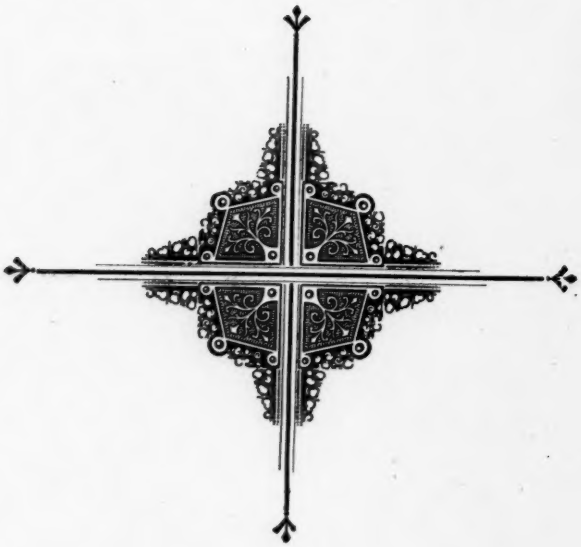

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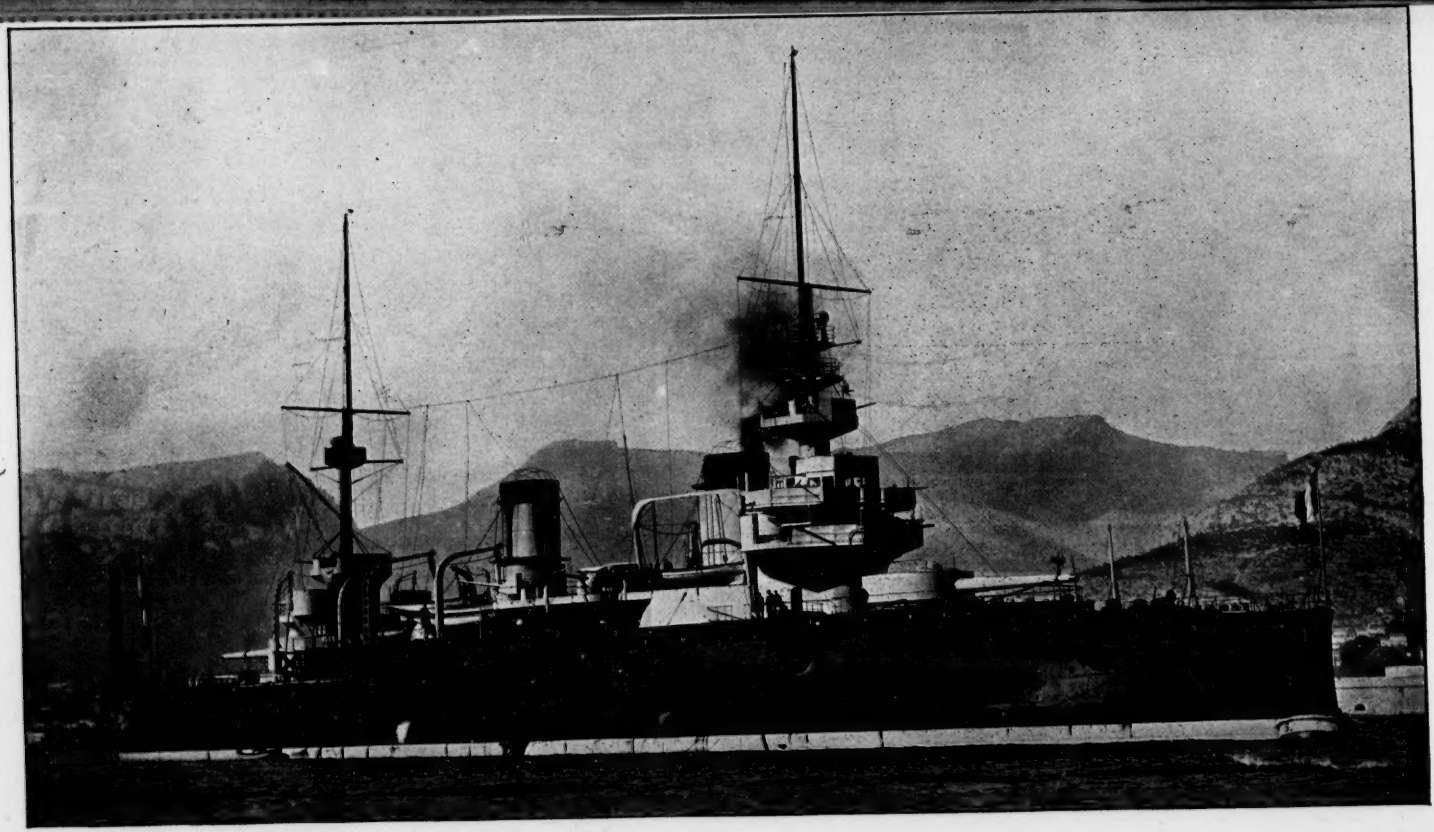

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VOL. XLIII. FEBRUARY, 1899. No. 252.

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APPENDIX TO THE REPORT OF THE CHIEF OF THE BUREAU OF NAVIGATION.

Government Printing Office, Washington, 1898.

AN interesting collection of reports has been printed by the Bureau of Navigation of the United States as an appendix to the pamphlet noticed in our issue of last month. It is dated the 1st December, 1898, and is signed by Captain Crowinshield, one of the three distinguished officers who formed the Board specially organised for the strategical purposes of the Navy during the Spanish-American war. The reports from flag officers, captains, and chief executive officers of the majority of the vessels who took part in the war have been "collected, arranged, and edited by Ensign H. H. Ward under the direction of the Bureau." The grouping of the reports is satisfactory when tested by the index, but there is no attempt at literary style, and perhaps for students an increased value is acquired, at the cost to the reader of some trouble, by the absence of purely literary editing, and the resulting nakedness of the professional narratives conveys the idea of absolute fidelity on the part of the respective writers, but the book remains as a collection of memoirs to serve for the formation of history—not as a completed work.

The principal headings are:—1. The voyage of the "Oregon." 2. The operations in the Philippine Islands and the fall of Manilla. 3. The blockade of Cuba and Porto Rico. 4. The destruction of Cervera's fleet. 5. The convoying and landing of troops in Cuba and Porto Rico.

As a foreword to the work, the list of those lost and saved when the "Maine" was destroyed is given in full, and, with some noteworthy exceptions, the reports are presented of the Courts of Inquiry, both of the United States and of Spain on that distressing event. In the opinion of the American Court, "The 'Maine' was destroyed by the explosion of a submarine mine, which caused the partial explosion of two or more of the forward magazines." The Spanish officers on the 22nd March,

record their opinion that "On the night of February 15th last an explosion of the first order, in the forward magazine of the American ironclad 'Maine,' caused the destruction of that part of the ship," and "it can only be honestly asserted that the catastrophe was due to internal causes."

On the 7th March, Mr. Long, the Secretary of the Navy Department, telegraphed to the captain of the "Oregon" to go from Bremerton in Washington Territory "to San Francisco as soon as possible, as the situation is getting worse"; she arrived at San Francisco on the 9th, and having filled up coal and ammunition, left on the 19th for Callao, which she reached in 16 days, averaging 10·7 knots during the passage. The "Marietta," gun-boat, had pushed ahead, and coal was ready in lighters for the "Oregon" on her arrival at Callao, and in three days she was again away for the Magellan Straits and Sandy Point, where the attendant "Marietta" had arranged for further coal for her consort; the "Oregon" ran at 11·75 from Callao to Sandy Point, and left on the fourth day for Rio, but in company with the "Marietta," whose diminutive size delayed her against a head sea; the pair reached Rio nine days afterwards, on the 30th April, and there received news that war had been declared on the 21st, and that the "Temerario," a Spanish torpedo-gunboat, was bound from Monte Video for the same port. The Spanish fleet from Europe was another threat, and if the vessels of that fleet had been as efficient in fact as they were on paper, a most formidable one; but the "Oregon" pushed on, and reached Bahia in four days, leaving the following evening for Barbados, which was reached on the 18th after a current assisted run of 11·73 knots per hour, and finally reached Key West in fighting order on the 27th, her bunkers alone requiring replenishment. This passage throughout averaging 11 knots was a considerable achievement, both for the vessel and the crew, and demanded and received most handsome acknowledgment from the naval authorities. The "mailed fist" of the Americans was a greater success than the historical attempt by the vessels of another country.

From early in January, Commodore Dewey, on the China station, was fully informed of the parlous state into which matters had drifted as regards the probability of continued peace between the Governments of Spain and of the United States, and proper precautions were being taken by him as the chief executive officer of the widely detached forces of a rich and strong nation: store vessels were purchased, and coal—the first necessity of a fleet—was acquired from various sources. On the 24th April the Secretary of the Navy in New York telegraphed to him:—"War has commenced between the United States and Spain. Proceed at once to Philippine Islands. Commence operations at once particularly against the Spanish fleet. You must capture vessels or destroy. Use utmost endeavours." To this despatch Dewey answered next day:—"The squadron will leave for Manilla, Philippine Islands, immediately upon the arrival of the United States Consul from Manilla," and simultaneously with the despatch of the message the squadron left Hong-Kong for Mirs Bay, where they anchored for two days, and left on the 27th.

The next message records the drama of Manilla Bay. From that place on the 1st May he sent by steamer to Hong-Kong, thence to be telegraphed to Washington, a hundred words relating the destruction beyond repair of Spanish power in the Philippines.

"The [American] squadron is uninjured; send immediately from San Francisco fast steamer with ammunition."

Dewey's later despatches are admirable in their terseness.

"The squadron in excellent health and spirits. I am assisting and protecting the Spanish sick and wounded, 250 in number. Will ammunition be sent? I request answer without delay. I can supply squadron with coal and provisions for a long period."

On the 4th May, the day on which the last-mentioned despatch was sent to be telegraphed from Hong-Kong, Dewey wrote his full despatch to the Home Government. He had reached Subic Bay on the 30th April, and, failing to find trace of the Spanish fleet, he pushed on and entered Manilla Bay about midnight, the last two vessels of his squadron exchanging harmless shots with the shore batteries. At 5 a.m two submarine mines were exploded innocuously, and immediately land batteries opened fire, some from a range of 7 miles, but the Spanish ships off Cavite were the proper prey of the fleet, and before 6 a.m. the Americans began firing with their 8-inch guns, as they steamed past and "counter-marched" past their anchored enemy, at ranges "varying from 5,000 to 2,000 yards."

The action lasted for two hours, the land batteries assisting their overmatched fleet, but Dewey sent word that Manilla city would be bombarded if its forts continued, and their fire ceased. At half-past 7 the American fleet hauled off to replenish ammunition on an unfounded report that some ships were running short, but returned to the attack in 3½ hours; the Spanish fleet in an hour's time was in flames, the batteries at Cavite were "silenced and the ships sunk, burnt, and deserted." Before 1 p.m. the squadron anchored off Manilla, leaving the "Petrel" to "complete the destruction of the smaller gun-boats, which were behind the point of Cavite." This duty was performed in the most complete manner, and the chief object of the Navy Board at Washington was absolutely achieved at nominal cost in injury to the men and material of the fleet of the United States.

Many points of detail can be gathered from the various reports:— The Commander-in-Chief here, as at Santiago, was on the bridge, the flag captains in either case being in the armoured tower; the secondary batteries easily wrecked an aggressive torpedo-boat; sheet cables were faked to protect ammunition lifts; electrical hoists and firing gear frequently failed; powder smoke invalidated the telescopic sights; the 6-pounder batteries fired 1,000 rounds without mishap; two-thirds of the engine-room gang worked the engines of the flag-ship effectually, the other third carried ammunition; ranges were obtained from cross bearings of the standard compass; the distance was taken from the chart. The "Baltimore" also had considerable trouble with the firing gear and breech actions of her main armament, although no guns larger than

6-pounders were Q.F., but her electric ammunition hoists were satisfactory. An erratic 4·7 projectile struck that vessel on the starboard side above, and penetrated the upper steel deck, glanced off the engine-room coaming, hit a 6-inch gun-carriage on the port side of the vessel, and came back dead on to the side of entry, exploding a box of ammunition on its journey and wounding eight men of a gun's crew. The 8-inch guns of the "Baltimore" caused considerable wreckage to her own boats and fittings.

The small cruiser "Petrel," carrying four 6-inch guns, fired 119 rounds of the 360 she carried of that calibre, but there was great trouble with her firing gear: four percussion primers were expended before one would act. The "pads" swelled from the heat, the breech plugs had to be shifted from the gun on the disengaged side, and two boats were shattered by the discharge of the after 6-inch guns. The "Boston," a comparatively old cruiser, with antiquated armaments, got off 80 rounds from each of her two 8-inch guns, but she had trouble with firing gear, breech blocks, and "pads," and the men in her magazines succumbed to heat; the blast of the 8-inch gun wrecked the deck, the rooms below it, the electric wire communication, and all the boats.

The ecstatic periods of the United States Consul should have found no place in a professional work:—"Our crews are all hoarse from cheering, and while we suffer for [? want of] cough-drops and throat doctors, we have no use for liniment or surgeons," prostitutes tragedy to pantomime.

The Spanish official account relates the fruitless cruise of the squadron to Subic Bay and back and the preparations to meet the coming storm. Admiral Montojo estimated the tonnage of the American ships at twice his own, with quadruple horse-power of engines, double the number of guns and those of higher quality, and nearly an equivalent number of men. He slipped both cables and springs as the engagement heated, the flag-ship was set on fire, and he left her for the cruiser "Isla de Cuba," but the fleet was overmatched and destroyed, with a loss of 381 men—a fifth of the total strength.

Dewey continued to blockade Manilla, and on the 12th May he was evidently anxious as to the possibility of the unwelcome arrival of more powerful ships from Spain. He armed his transports with captured guns, but until the prayed-for arrival of troops he was unwilling to risk a landing at Manilla, although that city was at the mercy of his guns; the troops leaving America on the 24th May were timed to arrive about the 17th June, and they actually landed on the 30th. Aguinaldo had been brought down from Hong-Kong in the "Nanshan." The Filippinos were numerous, enthusiastic, and unorganised; their leader proposed to attack Manilla city by land on the 31st May, but the attack degenerated into alarms and excursions in the province of Cavite, coupled with a mass of proclamations difficult of refutation in word controversy by that which he designated "the great North American Nation, the cradle of genuine liberty, and therefore the friend of our people."

On the 25th June Mr. Long warned Admiral Dewey that a Spanish squadron of "15 sail," including transports, had left Cadiz for the East,

and on the 27th Dewey suggests an attack on the Spanish coast as a counter-blast, and on the 29th he was informed from Washington that a squadron was being hastily equipped with this view; but the Spanish squadron under Admiral Camara was in monetary and other difficulties, and took no part in the war, beyond creating a temporary scare, and long before he had passed the Suez Canal Merritt's troops had landed at Cavite, and reinforcing vessels were gradually nearing Dewey from the Pacific coast. A message was sent on the 13th July by the Admiral, and the attention of the American nation was drawn to an incident which, if not promptly handled, might have led to serious international difficulties. "Aguinaldo informed me his troops had taken all Subic Bay, except Isla Grande, which they were prevented from taking by the German man-of-war 'Irene.' On July 7th sent the 'Raleigh' and 'Concord' there. . . . . The 'Irene' retired from the bay on their arrival."

Manilla city surrendered to a combined attack on land and sea by the Americans, and their flag was hoisted on the 13th August. The relative position of the Filippinos under Aguinaldo and the Americans under Admiral Dewey and General Merritt were strained, but the peace protocol of the 12th August relegated the future arrangements to diplomacy, and Mr. Rawson Walker and Mr. André, respectively the British and the Belgian Consuls, were admirable intermediaries, whose services were warmly acknowledged. The September despatches from Dewey are the last of his that are printed, and he reports the supplies good, and the vessels, with the exception of a few boiler troubles, in fighting order, the sick list moderate, considering the climate, and small-pox and plague—epidemic ashore—had spared the fleet.

The Pacific coast of America was unthreatened throughout the war, and the resources, both maritime and military, were expended in transportation to the Philippines; but friction—certain to arise in a new venture—sprang up between "the Army officers commanding and the captains of the transports"; neither knew the limit of their authority, and the captains resented interference in nautical matters; the transports were crowded and ill-found, especially as to water supply; vessels hired at £300 were kept idling for months together, a fault of organisation from which we suffered severely during the Abyssinian war; since that period we have learnt much by experience, which the Americans have now purchased themselves.

Admiral Miller reached Honolulu from San Francisco in the "Philadelphia" on the 3rd August, and hoisted the American flag on the 12th, and the Hawaii group changed owners with due ceremony. Guam, in the Mariana group, had surrendered on the 21st June; the Spanish governor, his staff, and a detachment of Spanish soldiers, were transported to Manilla.

On 23rd March Mr. John D. Long wrote a very able memorandum to the Commander-in-Chief of the North Atlantic Squadron, pointing out the general ideas that would have to govern the employment of his squadron, but leaving details for his decision. International positions of great intricacy might arise from the question of blockade, which, if war

broke out, would be a necessity, and blockade to be binding would have to be effective. Among other cautions, he warned the commander against perilling his vessels in action against land batteries, as the Spanish fleet was the real objective of the American ships, who had few docking facilities for repair; Sampson argued against the prohibition, but it was restated.

At the end of March Captain Sampson, the senior officer, painted his fighting-ships, except the torpedo-boats, lead colour with a black band around the funnels, and temporarily stored at Key West all superfluous lumber; scouting operations, as carefully carried on as if war had been declared, were put in force, and the day war was declared he was promoted to rear-admiral, and ordered to blockade North Cuba; he started from Key West on the following day (22nd) to carry out his instructions; it was acknowledged that no attack on the land could prove adequately successful without the assistance of military forces, but these were unprepared, and the rainy season was coming into full blast.

An outline of the general course of the war appeared in the January number of this JOURNAL; much of the work there narrated is retraversed, but in ampler detail, in the present report, yet some of the details are of instructive value.

On the 11th May, the boats of the "Marblehead" and "Nashville" cut a section of 24 fathoms out of one, and 15 fathoms out of another of the submarine cables off Cienfuegos; two steam launches covered the sailing-boats, and with their machine guns kept down the fire of Spanish soldiers in shelter trenches, whilst the larger vessels shelled the cable house and the neighbourhood; the "heavy armoured cables" were $1\frac{3}{4}$ inches in diameter, and were raised and cut from 13 fathoms of disturbed water in $3\frac{1}{4}$ hours, but rifle fire drove the boats off before they had tackled a third one; seven of the crews were hit and the boats perforated in many places. The loss would have been heavier, but the smoke from the steam launches blew towards the shore and concealed the working cutters, although the Spaniards themselves employed smokeless powder.

During the cable-cutting attack at Cardenas on the 11th May, the "Winislow" had both her steam and hand steering-gear disabled by a shot, and the wind was driving her ashore. For a short time she was kept in position by working her twin propellers, but another projectile entered the engine-room and wrecked one engine; Lieutenant Bernadou, himself wounded, continued going ahead and backing her remaining engine so as to avoid being a fixed target, till the "Wilmington" towed her out of action.

Captain Chadwick, the regular officer on board the chartered mail steamer "St. Louis," drew attention to the good behaviour of the crew of that vessel. In the United States the whole crew is taken over bodily when the ship is hired for Government service, and when employed in cable-cutting 2,500 yards from the mouth of Santiago Harbour they continued their work on the exposed forecastle in 500 fathoms of water whilst under continuous shell fire; the depth of water made the work specially heavy and long-continued, and the men never flinched till the

work was accomplished. That splendid vessel was ill-adapted for the special purpose on which she was employed. In order to recoal she was allowed to go to New York owing to its greater facilities over Hampton Roads for such an exceptional vessel, to which the extra 500 miles of the double journey was of small account.

The legal status of submarine telegraph companies is somewhat nebulous in the case of war, and the American Government warned the repairing-ship "Grappler," of the "W. I. P. T. Co.," that any attempt to repair cables running to Spanish territory would subject the vessel to capture as having committed an act of hostility. Several dummy cables seem to have employed the energies of one at least of the American vessels.

On the 9th June the commander of the gun-boat "Scorpion" altered course from his convoy and beat to quarters on sighting a large war steamer, which he took to be a Spanish man-of-war, and his crew "looked disappointed" when she proved on closer acquaintance to be H.B.M.S. "Talbot."

On the 22nd June, off San Juan, Porto Rico, the "St. Paul" drove back under the protecting batteries a small Spanish cruiser, but at 1 p.m. on that date the "Terror," a first-class destroyer, came out to the attack. The big ship was headed on a parallel course, "keeping the 'Terror' on such a bearing that in making a dash at the 'St. Paul' she would be obliged to proceed in the trough of the sea." At 1.20 the "Terror" went for her, but was disabled by gun fire while still long out of torpedo range, and headed back for the harbour, where she was taken in charge by two tugs, and beached in a sinking state.

On the 12th July, the "San Domingo," an armed Spanish transport with a valuable cargo of arms, ammunition, and stores was forced ashore near the Isle of Pines by the U.S.S. "Eagle," which fired over one hundred 6-pounder shells. As she was irrecoverably grounded, she was fired and destroyed, although, hull and cargo, her value was £200,000. Fair practice was made, as the passage of fifteen shells could be traced, all of which had burst, and two were through the water-line.

The "Annapolis," third-class cruiser, anchored off Baracoa, and on the 15th July an unoccupied battery was suddenly manned, and opened fire. "Short circuit" caused delay in the answering fire, and the sea prevented the bow guns from being used, but the after guns made sufficiently accurate practice to silence the battery. The vessel fired 275 rounds in half-an-hour.

Admiral Sampson's report of the attack on the defences of Porto Rico contains points of professional value. In the passage from Key West the monitors delayed the fleet to such an extent that eight days were consumed in a passage estimated to take five days at the most. During the engagement the speed was 4 knots, and small gun fire was stopped, as the smoke prevented the large guns from being accurately aimed. The after turret of the coast-defence ship "Amphitrite" was disabled without being struck, although the average range from the shore batteries was only 1,500 yards. The "Iowa," although hit by thirty-two

projectiles, was not seriously damaged by the enemy, but her 12-inch guns, both forward and aft, injured the structure of the vessel, and her deck beams were deflected to such an extent that the trolleys which supported the lower torpedo-tubes became useless. The ammunition was defective, and the elevating gear of the 8-inch turret guns yielded from constructive weakness.

The "Detroit," a 2,000-ton cruiser built in 1892, fired in the same action one hundred and seventy-five 5-inch, one hundred and twenty-three 6-pounder, and twenty 1-pounder shells, and developed structural weakness. The captain of the coast-defence ship "Terror" opened fire "into the inner harbour in hopes of striking any vessel anchored there, the smoke being so thick I could see nothing. When the air cleared I could see that the harbour was unoccupied, and fired no more shots in that direction." This vessel's recoil cylinders and rammers gave out; her pneumatic steering-gear promptly failed; the electric primers were unsatisfactory, and the friction primers worthless. Both guns in the forward turret were disabled by the vents choking and requiring to be bored out. This vessel proved in passage to be a dirty if not a dangerous sea boat, and her turrets had to be aproned and strutted to make her at all seaworthy. The "New York" was hit but once and the vessel not injured, but the 8-inch primers jammed. The "Indiana" went into action and came out in good order.

The first positive information of Cervera's fleet was sent from Washington to Sampson on the 13th May, the day following his action at Porto Rico. On that morning the Spanish squadron was reported from off Martinique, and Commodore Schley, with the flying squadron, was ordered from the North, and on the 18th reached Key West. On the 24th, the Spaniards were reported from Curaçao, and the "Harvard" gave the twenty-four hours' notice to the French Government of Martinique that was an accepted condition of her departure from that port. She and other ocean scouts were to gain and keep touch with Cervera, who, being short of coal, was expected to rendezvous with his colliers off the Venezuela coast; but the whole pack missed him, and he reached Santiago on the 19th without being obstructed or discovered. Schley was off Cienfuegos on the 21st, and had enormous trouble during his endeavour to recoal in the open sea from inadequately prepared colliers, and it is much to his credit that he maintained fair efficiency for so many weeks off the southern coast of Cuba, and without any disaster. The Commodore recommended that, for coaling at sea, coal should be sent in half-hundredweight bags. He is open to some criticism for not verifying the position of Cervera; he apparently thought that the Spaniards were at Cienfuegos, in face of the repeated statements from Washington that they were in Santiago, and it was not till after Sampson's return from coaling at Key West, and at a partial bombardment of the harbour on the 31st May, that the Spaniards were visibly located in that port. Fresh water supply for steaming purposes was another difficulty, as the two vessels fitted specially for condensing purposes were not complete till the close of the war.

The four great mail-steamers made splendid scouts, and whilst the blockade of the southern coast was maintained, their unrivalled speed enabled them to render invaluable services as messengers and scouts from whose attentions no vessel could escape.

The log of the "Cristobal Colon" from April 8th to July 3rd, fell into the hands of the United States, and is printed in full, and its seven pages of small print are worthy of study; her best run was between Teneriffe and St. Vincent, 310 knots, and from Martinique she ran 281 knots in 24 hours, towards Curaçao, but the trans-Atlantic voyage averaged only 170, a little more than 7 knots an hour. At the partial bombardment of the Morro Castle on 6th June, the "New York," launched at Philadelphia in 1891, showed the usual weakness of inefficient riveting, "due to bad workmanship," but greater experience in war-ship building will probably remove this recurring fault in many of the ships completed before the war. The battle-ship "Massachusetts," launched in 1893, was practically uninjured, except that the blast of her 8-inch after gun destroyed her whaleboat. In Guantanamo Bay both the "Texas" and the "Marblehead" each picked up a French-made mine, containing 100 lbs. of gun-cotton, which had been placed in position in April, but owing "to Divine care neither of them exploded." Sampson, on the 15th, ordered that all ships engaging batteries should fire with reduced charges and proportionately increased elevation, in the hopes of attaining a searching fire approximating to high-angle fire, but the effectiveness of even the best of fire from an unstable platform against earthworks was proved to be of a limited nature at the bombardment of the 16th. The "Massachusetts," a first-class battle-ship, with 13-inch and 8-inch guns, besides smaller weapons, opened fire on a 2-gun battery west of Santiago, which replied with "6-inch cast-iron shell of very poor quality"; the distance varied from 5,000 to 3,000 yards, and after firing for more than half-an-hour the land battery was silenced, but the "two guns appear to be still mounted"; "the sea was smooth and the weather calm." This same battery was attacked a few days later by the "Massachusetts," the "Brooklyn," and the "Texas," and was silenced; "the guns which were in position when the action began were still in position when we withdrew," and "when the fleet ceased firing and withdrew, the enemy quickly returned and fired one shot at each ship." On board the "Indiana" the "gas check pads" of the 13-inch guns were a constant source of trouble, and were frequently renewed, and this vessel and her armament are of modern construction.

Admiral Sampson's orders for the maintenance of the blockade of Santiago were based on the principle that six miles was the day limit of distance from the port, and four miles at night and in thick weather; picket launches each evening closed to one mile from the entrance, with small supporting steamers one mile in rear of them and the bigger ships on the outer circle. "The end to be attained justifies the risk of torpedo attack, and that risk must be taken. The escape of the Spanish vessels at this juncture would be a serious blow to our prestige, and to a speedy end of the war." A perfect system of day and night signalling

completed his instructions; a war-ship kept effective search-lights on the entrance, and a second vessel was at hand to fire without disturbing the light. The precautions were so good that later on the captain of the "Colon" stated it was impossible for the Spanish squadron to leave at night; the passage was narrow and tortuous, the light was blinding, and every movement was visible.

Seven thousand men were landed at Daiquiri during the 22nd June, and met with no opposition; feints were made by some of the war-ships on Cabanas and to the west of Santiago, and the "Texas" was struck by a heavy shell from the Socapa battery, which killed one man and wounded eight. Other troops simultaneously disembarked at Siboney, fifty steam-launches and cutters towed the rowing-boats full of troops, and the landing beach was supervised by Captain Goodrich, now acting as Chief of the Staff to Admiral Sampson.

On the 1st of July a heavy fire was opened by the bulk of the fleet to assist General Shafter in his main attack, and on the following day friction was in the ascendant between the two commanders. Shafter was urging Sampson to force the entrance, and the Admiral replied that till the forts were held he was unable to sweep the known mines from the entrance, and that even if he attempted so to do the certain loss of one or more vessels would permanently block the passage, already impeded by the sunken "Merrimac."

On Sunday, the 3rd July, Cervera made his attempt at escape, and the details are known from various reports of eye-witnesses. Sampson mentions the "amazing speed" of the "Oregon," but we now know her maximum was about 14. The "Iowa" and "Indiana," having chased the "Vizcaya" to destruction, returned to their blockading stations. The yacht "Gloucester" completed the destruction of the destroyers "Pluton" and "Furor"; she was handled with great skill, saved the survivors of the wrecked destroyers, and then hurried off to secure the crew of the "Maria Teresa," which vessel fell an easy victim, as her exposed fire main was cut soon after starting by a lucky shell, and being set on fire she was unmanageable. The "Brooklyn" and "Oregon" finished the "Colon," the last Spanish vessel to surrender, 48 miles from Santiago. The "Brooklyn's" forward engines were uncoupled throughout the chase, and as the distance run by the "Colon" was at the rate of 13·7, the accomplished pace of both fleets was considerably under their legend speed. The "Brooklyn" and "Oregon" are reported to have worked up to 16 knots by the time the "Colon" ran ashore. Coal was none of the best, the vessels were all foul, and some of them were unprepared for spurting for so long a period as four consecutive hours. The dangers of the passage caused gaps of 800 yards between the Spanish vessels, thus their fire was inadequately combined; but under any circumstances, apart from superior numbers in Sampson's fleet, his state of preparation, armament, and skill was far in advance of that of his adversaries. It was unlucky for the Admiral that at the moment of Cervera's sally he was some miles east of the harbour mouth, but the "New York" was quickly turned, joined in the chase, and if any check had occurred would have promptly been

present; as it was, she increased speed up to 17 knots with her forward engines uncoupled, as they were on the "Brooklyn," whose captain reported the breech-blocks of the 8-inch guns as constantly jamming, while the elevating gear of the 5-inch battery also gave great trouble —"at the end several were rendered useless for battle. Two are bulged at the muzzle." The "Brooklyn" fired 100 rounds of 8-inch, 473 of 5-inch, 1,200 of 6-pounder, and 200 of 1-pounder ammunition.

In the "Texas," many of the electric wires and fittings were carried away, both on her main and gun decks, and the rivets of the steel deck were sheared, allowing the deck itself to be separated from the supporting beams; the blast from the 12-inch guns was responsible for the damage, and the chief executive officer reports that the "Texas," built at Norfolk five years ago, was framed too slightly "to permit the further firing of the 12-inch guns over the decks without serious injury."

The battle-ship "Indiana," launched in 1893, opened fire on the procession of Spanish vessels before 10 a.m., at ranges varying from 4,500 to 2,000 yards, and one of her 13-inch shells set fire to the "Maria Teresa"; the 6-inch and 6-pounders were turned first on the destroyers, whilst the 13-inch played later on the "Vizcaya"; all four targets were destroyed by common shell, none other being used; few electric primers failed, but this vessel derived great advantage from her secondary battery using smokeless powder.

The "Iowa" opened fire about 9.40 a.m., at a distance of 6,000 yards, on the Spanish admiral, but closed in to eventually 1,000 yards range, and in half-an-hour the "Maria Teresa" and "Oquendo" were ashore and disabled; the "Iowa" was struck by two 6-inch shells: one burst, the other pitched dead into the cofferdam; she fired thirty-one 12-inch, thirty-five 8-inch, and 1,400 smaller shells.

The reports are printed which describe the condition of the wrecked Spanish vessels; it is noticeable how few large shells struck, but when they did the wreckage was heavy; the majority of hits were from 6-pounders, as has already been noticed in the December number of this JOURNAL, but the number of guns in the lost fleet that were disabled by gun fire is very small, while the inboard explosion of torpedoes had caused much damage. The fires that were universal did most of the damage, and the Board of Examination on the wrecks concludes "that the use of wood in the construction and equipment of war-ships should be reduced to the utmost minimum possible; that loaded torpedoes above the water-line are a serious menace to the vessel carrying them; that the value of rapid-fire batteries cannot be too highly estimated; and, finally, that all water and steam piping should be led between the protection deck, or below the water-line, and fitted with risers at such points as may be considered necessary."

THE TRAINING OF A BATTALION IN THE ATTACK.

By Major Sir R. COLLETON, Bart., Royal Welch Fusiliers.

Monday, June 6th, 1898.

Major-General J. B. STERLING, in the Chair.

IN carrying out a drill exercise of an attack by infantry, one must have previously decided under what conditions the attack is supposed to be taking place :—

a. Either the enemy's resistance is comparatively feeble, and the first line is able to carry the attack through without the assistance of the second line;

b. Or, as will be usually the case against a well-armed and civilised enemy, the attack can only be carried to a successful conclusion with the aid of a part, or the whole, of the second line.

It is evident that a battalion cannot be considered to be well trained and instructed unless it is equally prepared in peace for either alternative.

"Infantry Drill," 1896, recognises the necessity for such training, and we find it laid down in Sec. 126, para. 13 :—"A battalion will also be exercised as a battalion of the second line; in this case a skeleton firing line of a few men will sufficiently represent the advance and action of a checked first line. This is an important exercise, and should be frequently practised . . . ."

And yet in spite of this very plain direction, I venture to say that this "important exercise" is not practised so often as it ought to be. And why not? For the same reason, I think, that causes another most important direction for the conduct of the attack to be often overlooked.

In Sec. 124, page 133, we find :—"When about 500 yards from the position, more or less, according to the nature of the ground, the firing line endeavours to establish itself in good defensive positions all along the front, whence, as from a first parallel in a siege, both false and real attacks can be made on the position in front."

If we watch an infantry regiment at drill, practising the attack (I am not here speaking of practice in brigade at field days), I think we shall frequently see the battalion, disposed as a first line, carry the attack to a triumphant conclusion in about 20 minutes from the first extension, without the aid of a second line, and thus entirely ignoring the existence of

the two important paragraphs I have just quoted. The reason for this neglect lies, I believe, in the difficulty of simulating on a peace parade the material losses and exhaustion of moral energy inflicted on the assailants by the fire of the defenders, which, when the bullets are flying, brings the firing line to a standstill and renders it incapable of a further advance without reinforcement; and also, perhaps, because in our small wars we do not usually find it necessary to use the second line to reinforce the first, in order to carry the attack to a successful conclusion, as we should do against a better-armed European enemy.

A standard form of attack is very rightly forbidden, and I have no intention of contravening that rule by attempting to formulate one now. But "Infantry Drill" lays down certain general principles and rules in accordance with which the attack should be conducted. I propose to discuss how a battalion can best be instructed in peace, in accordance with those rules and principles, two of the most important of which I quoted in the beginning of my lecture, and which do not, I think, habitually receive the attention to which their importance entitles them.

I will now suppose the officer commanding battalion has fixed on some prominent and conspicuous object as the point to be attacked, such as a building, hill, or wood. This position should be marked by a few men furnished with a plentiful supply of blank cartridges, and also by some light, portable, vanishing targets, having heads and shoulders painted on them. Two or more men, according to the extent of the position, should be provided with red flags, large enough to be easily seen by the attackers at all distances. The use of these flags I will explain presently.

In order to simulate service conditions, the targets should not be exposed to view during the early part of the attack, as the defenders, using smokeless powder, would not usually be visible until the firing line of the attack had arrived at about 500 yards or under from the front edge of the defenders' position. During the earlier stages, the assailants would be obliged to direct their fire on such part of the building, or feature of ground to be attacked, as might be pointed out by the officers after careful scrutiny with field glasses. The judicious selection by company officers of the object to be aimed at, the clear and brief description of it by the fire-unit commanders, and the ready recognition by the men of the point of aim designated, are essential, and require constant practice in peace under conditions assimilated as far as possible to those of war. Such practice tends to the creation of a much higher standard of fire-control and discipline than is possible by constant practice at clearly defined targets, such as are necessarily used in the more elementary preparatory training in collective fire on the rifle range.

The targets and men marking the defenders' position should be under the command of an officer, who should be instructed to order the red flags to be raised from time to time during the attack. The raising of the red flags should be taken to signify that the attackers have been brought to a standstill by the fire of the defence, and that they are unable to advance without reinforcement. When the reinforcement has taken place, the officer directing the defence orders the flags to be lowered, and

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will keep them so until he judges fit to check the attack again, when another reinforcement of the firing line must take place, and so on. Of course, the commander of the defence must have been previously instructed, whether the officer commanding battalion intends to carry the attack through with a first line only, or with the first and second lines combined. This is necessary to guide the defenders as to the degree and amount of resistance they are to simulate. It is evident from the above description that the officer selected to conduct the defence should possess both experience and intelligence; and that he will have ample scope for the display of those qualities. If it is possible to supply him with men enough to form the skeletons of counter and flank attacks, so much the more realistic will be the defence.

Now let us return to the attackers. We are told in the Musketry Regulations, Sec. 149, that, for purposes of instruction in fire discipline, "it should always be imagined or understood, that magazines are charged, and that the rifle should be carried at the slope when on the move." And in Sec. 68, Rifle Exercises, that, "magazine fire must not be ordered by any section commander (except when he is acting independently) unless a distinct order to use it has been given by a superior officer." These are excellent rules, but I venture to think that they hardly go far enough. It is of the utmost importance "on service" that the magazines should never be allowed to become empty; and if it is allowed *to be imagined, or understood*, that they are charged, the necessity for charging them is very apt to be overlooked altogether. One frequently observes at drill "magazine fire" ordered, quite regardless of the number of rounds that have been fired from the magazine, or without any attempt being made after use, to replenish it. To obviate this, some battalions have an excellent rule, which is strongly recommended for adoption, viz., at the commencement of every drill, magazines are to be charged (or the motions performed), and after each occasion on which magazine fire is used, the officer who ordered magazine fire gives the command "Charge magazines," immediately after the order "Close cut-offs, or unload," and before making the next advance. It is also important, in order to prevent its being lost sight of, that the form, at any rate, of issuing extra packets of ammunition (in accordance with "Infantry Drill," Sec. 132, para. 8) previous to an attack should always be observed.

Extra ammunition having been issued and magazines charged, the officer commanding battalion will now issue his instructions as to the point of attack, extent of front to be covered, distribution of companies, etc. We need not here consider flank attacks, as all flank attacks are frontal attacks for the troops who make them. The officer commanding battalion must first inform his officers what are the conditions under which the attack is to be carried out, *i.e.*, whether the battalion is supposed to be acting alone, or in brigade; and if the latter, if it is to act as a flank, or central battalion; also if the battalion is in that part of the line which is to push the attack home, or if it is only to act as a containing force; and if the battalion is to push the attack home, whether he intends to carry out the exercise with the entire battalion in the first line, with an

imaginary second line, or if part of the battalion is to be in the first line and part in the second line. The idea under which the exercise is to be carried out will necessarily govern the extent of front and the distribution of the companies.

Now although a standard form of attack is forbidden, the guiding principles laid down in Sec. 124, para. 7, and Sec. 125, para. 4, are so explicit that there is not much room for doubt as to the distribution of the companies. In accordance with these principles we may assume :—

a. If the entire battalion is acting in first line, it will have—
Firing line and supports, 4 companies.
Reserve .. .. 4 „

b. If partly in first and partly in second line—
1st line { Firing line and supports, 2 companies.
Reserve .. .. 2 „
2nd line .. .. .. 4 „

c. Or, only a few men may be detailed to represent a skeleton firing line ; the bulk of the battalion being kept in second line.

For purposes of illustration we need only consider the first two alternatives.

If the nature of the ground permits of an advance under cover, the companies detailed for the firing line and supports will move in any convenient formation, preceded by such scouts as may be necessary.

If the extension is made at " distant ranges," *i.e.*, between 3,000 and 1,500 yards from the position, and in open country, a section only from each of the four companies will probably be put in the firing line. In this case, in order to comply with the rule which says " The frontage allotted to an attacking force should not exceed that which the troops composing its first line would cover were they deployed two deep," the interval between man and man will be four paces.[1] If the extension takes place at " long " or " medium " ranges (*i.e.*, under 1,500 yards) a half-company will probably be at once extended to two paces. This gives room for the supporting half-company to come up in the intervals of the firing line, and complies with Sec. 124, para. 7, which directs that as many men should be placed in the firing line as will be consistent with the efficient use of their rifles, *i.e.*, one man per pace. The intervals above given are fixed on the supposition that the battalion is in that part of the line which is intended to press the attack home. If the battalion is not in that part of the line, it will be allotted a greater extent of front, and the intervals must be proportionately increased. A battalion on the flank of a line, or acting alone, should have a small patrol 300 or 400 yards on the exposed flank or flanks. These patrols may be detached from the nearest flank of the firing line, or, if preferred, from the supports.

[1] A section equals one-eighth firing line supports and reserve of two companies, and in single rank must be extended so that each man occupies 4 paces, or 1 + 3.

A very important point is the maintenance of the true direction during the advance, by the several companies detailed for the firing line. The Drill-book lays great stress on this, and says that the cohesion and even the success of the attack depends almost entirely on the manner, in which the duty of seeing that the correct direction is maintained is performed by the officers in the firing line and by the captain of the company.

The task is, however, by no means easy, as anyone will admit who has watched a long advance by an extended line of a brigade or division. Even with a battalion, overlapping of companies, crowding in some parts of the firing line, and undue extension in others, are by no means an uncommon sight.

Even if we take the most favourable case, and suppose that the point selected for attack is visible from the spot where the extension takes place to every individual responsible for the direction of a unit of the line, and that the view remains uninterrupted during the advance, it is most improbable that the lines of vision to the objects selected as landmarks on which to march by the several commanders of units will not converge, or cross, during a long advance, and thus cause crowding and overlapping. It is clear, therefore, that we cannot rely on the eyesight alone to preserve the true direction.

The remedy appears to be to delay the extension as long as possible, as would naturally be the case when advancing through undulating or wooded country. As soon as extension becomes necessary, the captain and officer commanding the firing line of each company should carefully take the compass bearing of the line of advance from the centre of the company, in accordance with which points can be selected, from time to time, during the advance, on which the N.C.O. or man responsible for the direction should be instructed to march. Each company should march by its centre and close in as casualties occur; any gaps between companies thus caused being filled by reinforcement. If it be possible, when extension is ordered, to halt and complete the extension under cover, so much the better. Time spent in carefully forming the line at right angles to the line of advance will not, as a rule, be ill-spent or thrown away. Von Hoenig[1] attributes the successful advance of the 28th Prussian Brigade at Königgrätz mainly to the care and deliberation with which the lines were dressed, so as to ensure the brigade facing in the correct direction before the advance against Problus commenced.

We may now consider the primary extension completed, and the attack fairly under way.

Much stress is laid in "Infantry Drill" on the necessity of the attacking infantry reserving its fire as long as possible; at any rate, until within medium ranges, *i.e.*, 800 yards to 500 yards. It should be impressed on all ranks that the better the quality of the troops, the longer will it be possible to delay opening fire; and the shorter the range when it is opened, the greater will be the moral and material effect on the enemy. In this connection we may well recall the example of our predecessors.

[1] *R.U.S.I. Journal*, March, 1896, p. 294.

The attack on the village of Blenheim[1] and the conduct of Wolfe's Grenadiers at Quebec[2] are instances which readily occur as to the capacity of good troops to take punishment without reply; while Marshal Bugeaud bears eloquent testimony to the moral impression created on the French in the Peninsula by the habitual reservation of the English fire.

It may be objected that instances of the value of reserving fire for close ranges drawn from the days of Brown Bess are not applicable to modern conditions. I will turn, therefore, to the account of a battle fought a few years ago in the Chilian Cival War in 1891, when the troops on both sides were armed with modern weapons.

The well-known war correspondent Mr. A. Hilliard Atteridge, in his account of "The Fight for Valparaiso,"[3] between the troops of President Balmaceda and the Congressional troops, under Generals Canto and Körner, relates that at the battle of La Placilla "The Congressist troops had been warned to husband their ammunition (they had been somewhat lavish on previous occasions), and not to open fire till they were within 400 yards of the enemy, which is point blank [? fixed sight] distance for the long-ranging Männlicher. So, silently and steadily, with a few skirmishers in front, the 1st Brigade went up the hill, finding some difficulty in passing lines of deep pits and entanglements of barbed wire, prepared for its reception by the enemy. At last it got within the prescribed range, and the volleys of the repeating-rifle rang out." The result of the battle was a decisive victory for the Congressists, which gave them Valparaiso and ended the war.[4]

Now surely if it was possible for the new and hastily raised levies of the Chilian Congress to thus reserve their fire for decisive ranges, it should be possible for the highly-trained British soldier to do so; and with these historical precedents to guide us, it will not, I think, be asking too much of human nature, and especially of British human nature, if we demand that fire shall not as a rule be opened by the firing line of the attack at a longer range than 700 yards, and, wherever possible, that it should be reserved till 600 or 500 yards. On service, the exact distance must be decided in each case by the captains of companies, having regard to the standard of training and discipline existing in the troops they command. However desirable it may be to delay the opening of fire, the endurance of the men should not be strained to breaking point, and the captain must be watchful to forestall any disposition to open fire without waiting for orders. But when training men it cannot be too often insisted on that the chief advantage of the modern small-bore rifle is not its long range, but its flat trajectory, which increases the chances of

[1] "Battles of the British Army," Blenheim, 1705, p. 78.

[2] "Quebec 1759," p. 91. Home's "Précis of Modern Tactics," pp. 96 & 97.

[3] "Battles of the XIX. Century," Vol. II., p. 251.

[4] Compare also the defence of the Swip Wald (Maslowed) by the 26th Magdeburg Regiment at the battle of Königgrätz. They frequently reserved their fire until the Austrians came within 100 paces, and almost always with success.—Vide *R U.S.I. Journal*, July, 1897.

hitting at decisive ranges. This need not prevent advanced scouts, who should be marksmen, and who will lie down at about 900 or 800 yards, from opening a slow and steady individual fire, while waiting for the firing line to join them. Their fire, if it does no good, will at any rate do no great harm, and may serve to distract the enemy's attention from the advancing firing line. This does not apply to occasions when it is desired to act by surprise, and the fire of scouts would betray the advance prematurely.

The firing line, having overtaken the scouts, will move forward in a general line as long as possible, halting to fire when necessary, but the officers should always bear in mind that firing delays the advance and weakens the *élan* of the attack. They should remember the necessity of pressing forward unremittingly to seize the position of the first parallel, and that every cartridge saved until then will be worth two fired at longer ranges. This consideration must not, however, prevent a heavy fire being opened to cover the advance of reinforcements whenever the line, having been brought to a standstill by the fire of the defence, finds itself unable to continue the advance without such assistance—signified on peace parades by the raising of the red flag on the defenders' position. This point requires especial attention, as it is no uncommon sight to see the firing line moving gaily on, regardless of the reinforcements, who are frequently obliged to double 500 or 600 yards before they can reach the firing line, and arrive, in consequence, out of breath, and in a condition the reverse of favourable to good shooting. Young officers are apt to forget that the fact of reinforcements being ordered indicates that they are needed, because the firing line is unable to advance further without them. If their advance is not covered by fire a wise enemy will turn his attention to the reinforcements, as the surest way of stopping the advance of the attackers.[1]

"When the defenders' fire begins to tell seriously," and it is no longer possible to advance in a general line, an advance by alternate portions of the line will become necessary. Considerable difference of opinion exists, or perhaps I should say did exist, as to the size of the unit by which the successive advances should be made. "On service" the question will sometimes settle itself, as the stress of the enemy's resistance will not be equally felt all along the line. Those portions of the attacking line which are most favoured by the ground, or which from any other cause feel the strain least, and have in consequence the greatest amount of energy remaining, will often take the lead, and thus draw the bulk of the enemy's fire in that part of the field on themselves, as the greatest danger to the defence. With the pressure thus diminished, the rear portions, temporarily checked, will be enabled to advance under cover of the fire of the most advanced portions of the line, and so on.

But as it would not do to rely on a chance impulse of a portion of the firing line, it is necessary for war, as well as for instructional purposes,

[1] Skobeleff repulsed the fourth counter-attack of the Turks in the third battle of Plevna, after he had captured the redoubts by firing on the Turkish reserves.—*Vide* Mayne, footnote to page 222.

to have some system of advancing. The most suitable appears to be successive advances from a flank of half the firing line at a time. This enables a considerable volume of fire being used by the halted portion of the line to cover the advance of the other half, at a time when it is vitally important that a heavy fire should be maintained.

If the advance is made by small units chequerwise, such as alternate sections, or half-companies, the fire of the halted portion will be masked. If the advance be made by a succession of small units from a flank, it will be too slow. Of course, when dealing with large bodies of troops in brigade, there must be a limit to the size of the units of advance, which I am inclined to put at the front of a battalion. But for purposes of battalion training, I should say, Half the firing line at a time. The length of each advance and the pace, must depend on the nature of the ground and the distance from the enemy. It must always be remembered that "undue rapidity exhausts troops, and impairs the accuracy of their fire." This is especially the case when the ground is steep. Officers accustomed to mountain warfare on the North-West Frontier of India have a golden rule, "Go slow uphill." Men who are blown are not in a condition to meet a sudden attack at close quarters. When it becomes necessary to use the second line, to carry the attack through, it is probable that the whole of that part of the line thus reinforced will advance together with a "rush," towards the point to be assaulted, under cover of the fire of the containing portion of the line, which remains halted for that purpose.

Now for that vexed question, as to the best method of reinforcement. The great desideratum is, that units shall be mixed as little as possible. The Drill-book says:—"All reinforcements should be made from the same unit as long as possible." Quite so; but the crux is in the last four words, "as long as possible." Admixture of units must take place eventually, in a stubborn fight, try as we may to prevent it. Indeed, the Drill-book warns us to expect "that the stress of battle will have brought about in certain portions of the field a mixture of companies, battalions, and even brigades, rendering the work of command more and more difficult."

Many schemes have been devised to obviate, or minimise, this difficulty. Although they differ in details, the same idea pervades them all, viz., to divide the company into four lines, extended one behind the other, each of which as it reinforces the fighting line, is to come up into the intervals of its own company. Some even go so far as to split up the second line in the same way. These schemes look very pretty, mathematically drawn to scale on paper, and answer fairly well on parade for a company or even a battalion. But they fail utterly where larger numbers are employed. The cause of failure is the impossibility of ensuring (in the attack by a brigade or larger body) that each succeeding portion of the company shall keep exactly in rear of the corresponding portion of its own company which is in front of it. If the supports drift to the right, or left, of the firing line, as they inevitably will, during a long advance over broken or enclosed ground, they are reduced to the alternative of either moving to a flank under an effective fire, in order to reinforce their own

companies, which is impossible; or to reinforce the company in their immediate front, which is not their own; whereby the *raison d'être* of the formation is lost.

I remember an instance of this occurring at Lucknow, when practising the attack in accordance with "Infantry Drill," 1889. It will be remembered that the system then in force was, that the two centre sections of the company were extended in the firing line, supported by the outer sections, which were to reinforce on the outer flanks of the extended sections, and thus restore the company to its original order.

At a cold weather camp of exercise the division was drawn up on the grand parade ground to be practised in the attack against a skeleton enemy posted near the Alum Bagh, about 3,000 yards distant. The division (two brigades) formed for attack with a firing line, in accordance with the Regulations, of 1,726 paces, or nearly a mile long. The ground over which the advance was made was fairly level, but was intersected by large fields, the boundaries of which consisted of tall elephant grass 8 to 12 feet high, which frequently hid the firing line entirely from the supports, 200 yards in rear. On nearing the Alum Bagh, the division emerged on an open plain, and just as the supports were clearing the last of the elephant grass, the enemy posted behind a railway embankment opened a heavy fire at about 500 yards range, which necessitated the reinforcement of the firing line. It was then seen that the outer sections in support had drifted some hundreds of yards to the left of their respective inner sections in front. It was contrary to the Regulations to reinforce any but their own company, so they were obliged to take ground for several hundred yards to a flank under a heavy and effective fire to get opposite their proper intervals. The result "on service" may be imagined.

A study of the Regulations leads to the conclusion that three methods of reinforcing the firing line are therein contemplated:—1. Reinforcement by the supports in the intervals between the files, the exception being when a section only has been extended as a screen. In this case it would be advisable to close the section, so as to admit of the remainder of the half-company reinforcing on the proper flank. 2. "After the absorption of the supports, gaps in the firing line will be filled by bringing up sections, or sub-sections from the reserve." 3. By the second line which in successive waves "advances, and as it strikes the first line, carries the assaulting portions of it forward." This process being repeated by wave after wave "until near enough to rush on the position." These waves, we may presume, will be formed in single rank, one man per pace, and in a big engagement will each be composed of several companies. The question now arises how is the second line to act on reaching the firing line, and after the forward impulse it has given is exhausted. The Drill-book says "firing as they go." This can hardly mean firing when actually "on the move," which is, I think, rightly discountenanced in our Service, although "rapid firing on the move" is employed by the Russian infantry during the last stage of the attack, *i.e.*, from the last advance to the assault. "Firing as they go," means, I take it, that when the onward impulse of the last wave which has reinforced

the firing line is exhausted, the line will come to a standstill, and open a heavy fire to cover the advance of the next wave.

Now, if the firing line has hitherto been kept at its proper strength of about one man per pace (which may be taken as the maximum "consistent with the efficient use of their rifles"), it is evident that there will not be room for all the second line to reinforce in the intervals between the files, however great may have been the casualties during the advance. Those, therefore, who are unable to find intervals must form a rear rank, and move up into the front rank as casualties occur, to make room for the next wave. Every effort must be made to minimise the evil, as far as possible, of men, as successive waves arrive, being formed more than two deep. Two ranks are bad enough. "Death loves a crowd," writes Kinglake; more especially does he do so, when his messenger is the modern small-bore bullet, which is capable of penetrating three or four men standing one behind the other.

In order to make room for the reinforcements, it is necessary in peace to simulate the losses which would occur in war, by a system of causing men to fall out as "casualties." The best way to manage this, I think, is to have a standing order in the battalion, that at each halt during the attack, the flank men of each section of the firing line, supports and reserve, shall remain on the ground, when the section, to which the men belong, makes its next advance. As the supports and the reserve halt less often than the firing line, they will thus lose proportionately less. If it is desired to simulate very heavy losses, two men on each flank of the section, instead of one, may fall out at each halt. This should be settled by the officer commanding battalion in his instructions previous to the attack. At the same time, certain officers and section commanders should be also designated as "casualties." It is particularly important that company and other leaders should thus fall out, as it accustoms the men to the frequent change of commanders which the exigencies of war will create. It also habituates junior non-commissioned officers and selected soldiers to the command of half-companies and sections under difficult circumstances. I know of one regiment in which all the officers are frequently ordered to fall out, and the attack is excellently carried out by the non-commissioned officers alone. This practice cannot fail to give the non-commissioned officers great confidence and self-reliance, and tends to prevent the confusion which would probably arise "on service" by the heavy loss of officers, which is one of the features of modern war. "Casualties" should remain on the ground where they have fallen, until the whole of the first (or second line, if there is one) has passed them, when they should rise and place themselves under the command of the officer and non-commissioned officers detailed for the purpose, who will re-organise them, and lead them forward to the fight.[1] They may either act as a third line, or the rear *échelon* of the second line, as may have been previously ordered. But in order to prevent unnecessary shouting and orders during the attack, all the

[1] Compare the conduct of the Prussians during the struggle for the Swip Wald, Königgrätz.

arrangements as to "casualties" must be settled previous to the first extension.

"Throughout the advance advantage should be taken of every opportunity to reform, or tell off, the troops engaged. This is more especially necessary after the delivery of a successful assault." The Drill-book rightly lays the greatest stress on these injunctions, which are repeated in different forms no less than five times in the portion of the book which treats of the "Attack." Indeed it is not too much to say, that in face of a strenuous resistance the successful issue of the attack mainly depends on the skill and rapidity with which opportunities are utilised to re-organise the units and remedy the inevitable disorder arising from that mixture of companies, battalions, and even brigades, which we are warned to expect.

When opposed to modern breech-loaders, the assault is only possible on the condition "that the attack has gained a superiority of fire over the defence." That superiority is only to be obtained by the maintenance of an iron fire discipline, which again depends on strict fire control by the commanders of the fire units into which the attacking line is divided. Nothing is more difficult than the re-organisation of units which have become dissolved by the fire of the enemy, and the admixture of companies and battalions caused by successive reinforcements of the firing line. Also nothing is more necessary. Yet we frequently see a battalion carry out an attack without any attempt being made to practise this vitally important exercise. The re-organisation of units is, I am aware, a very thorny subject. Nevertheless, it is imperative that it should have been so practised in peace as to have become a second nature even under fire. It will not therefore do to shirk consideration of how it may best be carried out, so that the method we practise in peace may be practical in war.

When fire units become mixed after reinforcement, officers and N.C. officers in the firing line should take command of the men nearest them, whether of their own company or regiment or not. After each reinforcement and before making a further advance, officers should see that the fire units are at once told off afresh. The most feasible way of doing this is, I think, to consider the extent of front allotted to the battalion as divided into as many parts as there are companies detailed for the firing line and supports. Each company will then absorb all men reinforcing its portion of the firing line; and will retain them until a more complete re-formation enables them to rejoin their own companies. It will then only be necessary for each officer commanding a company in the firing line to tell off his sections afresh after each reinforcement. Sections, or sub-sections, which have been pushed forward intact to fill a gap in the line should attach themselves temporarily to the company next on their right. Any chance cover will facilitate re-organisation: the better the cover the more complete the re-organisation.

The above system of re-organising and telling off seems practicable, as long as the battalion reserve remains unexhausted, by which time, if

not before, it is to be hoped the first line will have seized the position of the first parallel, from which it may expect to establish the superiority of fire necessary to prepare the assault.

If, owing to the feeling "that the defence is weakening in its front," the initiative for the assault proceeds from the first line, which will therefore continue its advance, the method of maintaining the organisation of the fire units, sketched above, will still hold good. But directly it becomes necessary to call on the second line to carry the assaulting portion of the line forward by successive waves, we must abandon any hope of maintaining such minute sub-divisions of the assaulting portions of the line. From what has been said under the head of reinforcing, it will be seen that it is unavoidable that the assaulting line will be in many places two deep, and even, it is to be feared, in spite of our efforts, three or four deep in places. We cannot stop to re-organise fresh units, or we shall lose the impulse given by the last wave of the second line, and weaken the *élan* of the attack. All that we can do, as soon as the forward impulse communicated by the last wave is exhausted, is to open a heavy independent fire to cover the advance of the next wave. As soon as it strikes us, on we go again; and so on, until near enough to rush the position with the bayonet. The maintenance of fire units is under such circumstances impossible. "Independent firing," controlled by the whistle, is alone possible. The stricter the fire discipline we have inculcated in peace, the more coolly and deliberately will that fire be delivered. Owing to want of practice in second line, I do not think it is generally recognised that, on reinforcement by waves, firing must become "independent" in the portion of the firing line so reinforced. If it be admitted that I am right, it follows that practice is urgently required in "mass firing," which is merely independent fire brought under control.

On page 120, the Drill-book, after describing the action of the second line, says:—

"Throughout the advance advantage should be taken of every opportunity to re-form or tell off the troops engaged"! Does this include the assaulting portion of the line, during the progress of the assault? I can hardly think so. For the reasons given above, any considerable halt for the purpose of re-organisation so close to the enemy is impossible, unless, indeed, cover should exist close to the enemy's position, which would serve as a second parallel. Even then we should have to be cautious before we undertook in such close proximity to the enemy any considerable re-forming and assembling of units, which would involve a more or less entire cessation of fire, which would certainly invite a counter-attack, at a time when we should be least able to meet it. Should the attack appear likely to succeed, it would be preferable to deliver the assault at once, and re-form *after* we have taken the position. When the enemy is "on the run," or shows signs of wanting to run, it is well to keep him in that frame of mind, by pushing him with unrelenting vigour. If, however, the enemy declines to run, and the success of the assault appears doubtful, by all means seize any cover near the enemy's position we are fortunate enough to find; hang on like grim

death until reinforcements can arrive, under the cover of whose fire re-formation can take place and a fresh assault can be organised. But whether cover be available, which can thus be used as a last parallel, or not, it must be impressed on the men that under no circumstances must they retire. If not strong enough to carry out the assault, they must not relinquish the ground already gained. Make them understand that their only chance of safety is to hang on like bulldogs, and that whatever loss they may incur in doing so they will lose far more by retiring.

If the assault is successful, the attack must be continued against any portion of the position still held by the enemy, but we must be careful not to advance beyond the further edge of the position, leaving the pursuit to the cavalry, artillery, and third line; under cover of whom the first and second lines must at once re-form, tell off, re-issue fresh ammunition, and make every preparation for meeting a counter-attack.

I have not thought well to interrupt the above description of the method I propose for the instruction of the battalion in attack by any reference to counter-attacks by cavalry. But I venture to think it is a subject which deserves rather more attention than the present Drill-book bestows on it.

In Sec. 124, para. 18, page 140, we find the direction:—"Troops will be practised in receiving cavalry. The extended line will act as described in 54, the supports as in 73. The reserve, or troops in closed order, will act on the principle that the most suitable formation is that which brings the greatest number of rifles to bear on the approaching cavalry." This is excellent and perfectly clear as regards the action of the supports and troops in rear of them; but Sec. 54 is not very explicit as to how a cavalry attack is to be met by an *extended* line. It says:—"It is to be explained that *groups* of well-disciplined infantry on broken ground, or with their backs to banks, hedges, or any obstacle may defy relatively larger numbers of cavalry. The immediate presence of bodies of cavalry may demand a closer formation than that of the extended line. In such cases the men of the section may be ordered to form round their leader. At drill, this will be signified by the command 'Cavalry,' when the men will double to their commander, form round him, fix bayonets, and turn towards the direction in which the cavalry is advancing."

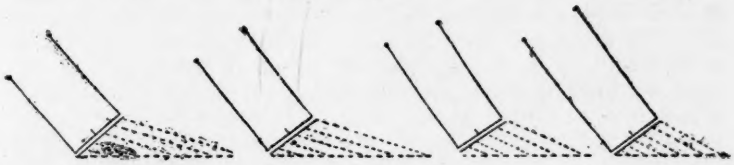
The section quoted above leaves, as was persumably intended it should do, a considerable amount of latitude as to the way in which the firing line should meet a cavalry attack.

On studying the first paragraph, the first thing that strikes one is the use of the term "groups." The 1893 and 1896 editions of "Infantry Drill" give no instructions for the formation of "groups," such as is to be found in the 1889 edition. It must, therefore, be presumed that "groups" means any small bodies of men that may have collected together after cavalry have succeeded in riding through, or over, an extended line. And the first paragraph of Sec. 54 apparently means to impress on the infantry soldier that, even if surprised by cavalry, he still has the means of offering a stout resistance. Judging from the results of the attacks of Michel's and Bonnemain's brigades at Wörth, and

of de Gallifet's and Margueritte's cavalry at Sedan, we may assume that an extended line of well-disciplined infantry, who keep cool and fire steadily, is well able to beat off the most determined cavalry charge, provided they receive sufficient notice of the impending attack, and see it in sufficient time for their fire to take effect.

The Drill-book permits of the alternative formation of section rallying squares, to be formed on the command "Cavalry."

The question which of these two alternatives is the better to adopt would, I think, be determined by the direction of the attack. If the cavalry attack is from the front, then we can safely rely on the fire of our extended line; but if the attack is from the flank, or so oblique to the front that we cannot bring our rifles to bear in time, we must form rallying squares, as the best formation for defence until the fire of the supports and reserves has had time to take effect. In such cases I should prefer that the squares should be formed by rallying forward towards the threatening flank of each section, rather than back towards the centre, or reverse flank. The moral effect of allowing men to run with their backs to the enemy is not good.



The above diagram represents an extended line meeting a cavalry attack oblique to the front (in this case half-left), by rallying forward to the threatened flank—an alternative formation to "rallying squares"; which obviates the necessity of turning the back to the enemy when cavalry is advancing.

On the command "Cavalry left" (or right) the left-hand man of each section turns half-left (or the right-hand man turns half-right), the remainder of the section closes on him two deep. The sections are now restored to their original close-order formation in two ranks, and can be more easily handled than when lumped together higgledy-piggledy in rallying squares. Being in *échelon* they can support each other by fire, without moving backwards or forwards; unless the attack is almost direct from the flank, in which case they can be easily moved to any position desired. The maximum amount of fire is obtained without the confusion caused by men forming *round* their section commanders, and without sacrificing a considerable portion of their fire, as in forming rallying squares. If necessary later, ovals can be formed by throwing back the flanks of the sections. The extension is easier than from "rallying squares," as the outer flank man has only to run towards the inner flank of the section behind him.

I must say I prefer the old command "Form rallying square" to the present order of "Cavalry," as the signal for the sections of the extended

line to close round their respective leaders. As has been shown above, there are two methods of receiving cavalry, and the use of the command "Cavalry" for one of them only is apt to lead to the conclusion in the mind of the soldier that there is only one mode of action on the approach of cavalry, viz., to form rallying square, which in the case of a frontal attack is an error, as it throws the line into a certain amount of confusion at a time when the utmost steadiness is essential, and causes cessation of fire and loss of time at a critical moment, which would be better employed in cool and steady firing on the cavalry, not to mention the favourable target which the rallying squares would offer to artillery and infantry fire.

The attack on the village of Bor and the Britz Wood by the 28th Prussian Brigade at the battle of Königgrätz affords a striking example of the evils of forming rallying squares unnecessarily; not only was the advance completely checked, on a false alarm of "Cavalry," but increased loss was caused by the favourable targets the squares afforded, and the firing line had to be reinforced to give a fresh impulse to the movement.[1]

A very important point is the distance at which it is advisable to open fire against advancing cavalry. This depends, I should say, in the case of troops armed with the Lee-Metford, on whether bayonets are fixed or not. The Regulations lay down that within 500 yards the fixed sight is to be used, and the bayonet fixed at and within 350 yards. As the bayonet has the effect of lowering the trajectory of the rifle, it is necessary, if we wish to open fire at medium ranges, say 800 yards, to allow for this lowering of the trajectory when naming the elevation to be used, and to order an elevation greater than that of the estimated distance. On consulting the trajectory table of the fixed sight, on page 54 of the Musketry Regulations Lee-Metford rifle, we find that with the bayonet fixed, when aim is taken at the foot of an object at 400 and 500 yards, the bullet "cuts the line of sight at about 400 yards." Over 400 yards, *i.e.*, at all ranges between 500 and 800 yards, we must add about 60 yards to our estimate of the elevation to compensate for the fixed bayonet (*vide* Musketry Regulations, 1898). Now, it is already quite hard enough to guess—or, as an old musketry instructor, perhaps I should say "judge"—distance with any approach to accuracy in the field, without introducing any additional complications. If bayonets are to be fixed—as they must be, if there is any chance of the cavalry coming to close quarters—it must be done as soon as the attack is discovered; as it is manifestly inadvisable, if not impossible, to cease fire, for the purpose of fixing bayonets, when the cavalry arrive at 350 yards. I should therefore advocate fixing bayonets at once, and reserving the fire until the cavalry reach 400 yards, and then open fire with magazines—say a volley at 400, followed by independent firing. If it be objected that it is inadvisable to let the cavalry come so close as 400 yards, I would instance the conduct of the German infantry at Sedan, who broke up the leading line of General de Gallifet's brigade with independent fire at 60 paces, and that when armed with a single loader, and not a magazine rifle. Moreover, our

[1] Vide *R.U.S.I. Journal*, March, 1896, p. 301.

ancestors of the Peninsula and Waterloo were in the habit of meeting with calmness the charges of the French cavalry, although only armed with a muzzle-loading musket, which could not be depended upon to hit a haystack beyond 100 yards. We must have strangely deteriorated if we are unable to do the like with the Lee-Metford rifle and a reliable stopping bullet.

So long, then, as we receive sufficient notice of the attack, we should have little to fear from cavalry, however bravely and determinedly they may charge; but there is the very important proviso that we perceive the attack in time. Can we always rely on receiving sufficient notice? I think not. There will be many occasions when, owing to infantry being hotly engaged with other infantry, or when favoured by fog, dust, undulations of ground, or other cover, hostile cavalry will be able to get within a few hundred yards of the infantry before their presence is observed. This is especially the case with small bodies, such as one, or two, squadrons of divisional cavalry, which are easily concealed by cover of small extent, such as a copse or farm-house. In such cases, and when attacked suddenly in flank, infantry cannot always count on preventing the cavalry charging home, and they must be prepared to stand the attack with the bayonet alone, as their forefathers did before them. This at any rate is the opinion of the distinguished Russian General Dragomiroff, who, speaking of cavalry attacks, says:—"In attacks at 300 paces there is no time for volleys, in those at 100 paces none for altering the front. In this case all that can be done is to make a turn towards the enemy and charge bayonets."

I myself have seen infantry surprised by cavalry twice in the same day—once immediately after a successful assault on the enemy's first position, and while the infantry were re-forming, and a part was still fording the river the enemy had defended; and again, during the charge to carry the second position. On each occasion the cavalry—about a troop—favoured by the ground, swooped down on the flank of the infantry from about 100 yards distance, and were upon them before they could fire a shot. If this could happen at a field day it seems still more possible "on service." On such occasions the infantry soldier must be taught to rely on his bayonet, and it is for this reason that I should like to see the old position and command "Prepare for cavalry" re-introduced. Although rare, instances are by no means unknown when cavalry have charged home on to the bayonets of the infantry; and in old days infantry were trained to expect that the cavalry would do so, and that in their bayonet they had a weapon which would enable them, if they stood their ground, successfully to resist such a charge. The result was that the Peninsula and Waterloo infantry, on the approach of cavalry, having delivered their fire at short range, came down to the "Prepare for cavalry" with the calm confidence which gained for them a European reputation.[1]

Would the British infantryman of to-day receive a charge of cavalry at close quarters with the same *sang-froid* as his forbears? I fear not.

[1] "Sketch of Waterloo," Maffling, p. 100.

His present training virtually teaches him to rely entirely on the fire of his rifle, which will prevent the cavalry from ever closing with him; in fact, it is scarcely worth while to fix bayonets at all. His surprise and dismay will be proportionately great when he finds, some fine day, the cavalry are upon him before he has had time to fire a round. Would it not be wiser, by re-introducing the position "Prepare for cavalry," to teach the infantryman to expect that cavalry will occasionally get to close quarters with him, and that they are not such fools as to charge unless they hope to do so? On such occasions the order "Prepare for cavalry"[1] will have a steadying effect, and should there be time to fire the soldier will aim all the better for knowing that in the last resort he has, in his bayonet, a trump card up his sleeve that, played with boldness, will still give him a fair chance of the game.

The value of strict fire control and discipline is now generally recognised in our Service, as also the fact that they are part and parcel of every-day drill, and not a separate branch of training. Although we realised this somewhat tardily, we may, I think, congratulate ourselves that of late years we have made considerable progress in this direction. Still, we are by no means perfect, and a few words on the subject may not be considered superfluous.

Although it is known that independent firing gives slightly superior results in peace to volley firing, yet considerations of discipline and fire control cause nearly all authorities in England and the Continent to prefer volley firing for war purposes, whenever possible. But there is great difference of opinion as to how long it is possible to maintain volley firing when on the offensive. The Germans deny the practicability of volleys within effective range of the enemy's fire, and therefore only employ them as an exception, or at the beginning of the attack, and rely chiefly on independent fire. The Russians are the most thorough-going adherents of volley firing, while the French, like ourselves, fire volleys as long as possible by sections, and occasionally by half-companies.

Our Regulations prescribe volleys at long and medium ranges, and until the captain orders independent firing, and lay down that as a rule, the latter is only advisable at decisive ranges. The steadying effect on the men is so great, and fire control and discipline are so much facilitated by volley firing, that there can be no doubt we ought to strain every nerve to maintain it as long as possible—how long that will be is the question. The answer depends, I think, on the quality of the troops, their training in peace, and on national characteristics.

The Russian soldier is famed for his stolid imperturbability, and his officers probably count on that trait, when they expect him to maintain volley firing to a late period of the attack. The British soldier has always been famed, by the admission of friends and foes alike, for the possession of that invaluable quality *le calme dans la colère*; he also serves more

[1] The position "Prepare for cavalry" is the only one for a closed body, such as a rallying square; as there is no room for dancing round the cavalryman, as in single combat.

than double as long with the colours as the Continental soldier. We are therefore justified in demanding from him a very high standard of fire discipline, which will obviate the necessity of a premature use of independent firing. As long, therefore, as it is possible to maintain the subdivision of the firing line into organised fire units, it should be possible to fire volleys. From what has been already said on the conduct of the attack, it will be remembered that we expect to be able to maintain the sub-division of the firing line until it has absorbed the whole of the reserve of the first line. So long, then, volleys should be possible. But as soon as it becomes necessary to carry the assaulting portion of the line forward by the impulse of successive waves of the second line, we must give up all hope of maintaining organised fire units in the assaulting portion of the line, and must of necessity resort to independent firing, which must be rigidly controlled by the sound of the whistle.

I would here draw attention to the perfunctory manner in which many officers use their whistles on parade, so that frequently the distinction in meaning between a long and a short whistle sound is entirely ignored. The whistle used should be the most powerful procurable. The Government whistle issued to N.C.O.'s is so feeble as to be quite useless, and many regiments have provided their N.C.O.'s with more powerful ones from regimental funds. Another point that requires attention is the training of officers and N.C.O.'s in observation of fire. This is absolutely necessary to an intelligent direction of fire and correct sighting of the rifles. All should be acquainted with the remarks on this subject to be found in Mayne's "Infantry Fire Tactics," Chap. XV., 9, page 401.

Blank ammunition should be freely used on peace parades, to simulate service conditions as much as possible. Without it, the correction of mistakes is very difficult.

It is only by paying attention to such details that we can hope to build up a system of fire control and discipline that will stand the rough test of service in the field. But good fire control and discipline are only a part of musketry efficiency, and in order to derive the fullest advantage from them we must have attained to a high standard of individual marksmanship. Of the value of the latter qualification we received a rude lesson under the Boers in 1881, and more recently from the Afridis. We have improved considerably since 1881; though whether our present annual course of target practice is the one best calculated to produce good shooting under service conditions is an arguable point, on which I shall not now enlarge. But few will care to dispute the point I am now anxious to make, viz., the greater the individual skill in shooting of our soldiers, the greater should be the effect of their collective fire.

Success in battle depends mainly on the attainment of superiority of fire over the enemy. That superiority can be obtained in two ways, either by a greater volume of fire due to the employment of superior numbers, or by superior accuracy of fire; or, in other words, by quantity or quality. With a small Army like ours, the former method of obtaining the superiority of fire is debarred, and we must therefore devote all our efforts to improving the quality. Nor need we despair. The British

soldier, whether with long bow or musket, has always in the past been famed for his deadly fire, which has decided many a field against superior numbers. If there is any truth in the doctrine of heredity and race, we should be able to do so again.

Von der Goltz, with prophetic eye, looks forward to the time when "a new Alexander will arise with a small host of well-trained and skilled warriors, drive impotent masses before him, when these latter, in their endeavour to increase in numbers, overstep the right bounds, and lose their internal efficiency, and, like the green standard army of the Chinese, become transformed into a numerous but peaceful host of Philistines."

There, Gentlemen, is *our* goal; but it is not to be reached without severe and sustained effort in peace on the part of rulers, officers, and men, and careful adaptation of means to ends. To-day is the day of large Armies. On all sides we hear of nations increasing their numbers by decreasing the term of service with the colours, with an inevitable reduction of efficiency. But these enormous hordes have been known before in the world's history. Be ours the task, who belong to the small Army, to fulfil von der Goltz's prophecy, and cause history to repeat itself!

General Sir WILLIAM GORDON CAMERON, K.C.B. :—I did not intend to speak, had I not received a hint from the Chairman, because it appears to me that the lecture really raises no controversy. As far as I understand, the lecturer is nearly in accord with the Drill-book, and merely wishes to inculcate a proper methodical way of carrying out its teaching. The only point of controversy that I observe, perhaps, is with regard to firing. I think the lecturer advocates a more liberal independent firing than is prescribed in the Drill-book. I think the lecturer proposes commencing the independent firing much sooner than the book contemplates. Is not that so?

Sir ROBERT COLLETON :—Not quite. I wish to preserve the volley firing as long as possible. The only question is whether it is possible to maintain volley firing when you once begin to reinforce for the second line, owing to the difficulty of preserving the organised fire union.

General Sir WILLIAM GORDON CAMERON, K.C.B. :—I think, as far as my own experience goes, that when you get under a very heavy fire, the maintenance of volley firing is no longer possible. We are told that volleys are only effective if delivered coolly, and the officer commanding the firing party gives his executive words of command with the utmost deliberation; and it appears that when you get under a very heavy fire of the enemy, you can no longer carry out your volley firing in this deliberate manner, however good the troops. I think that none of the foreign Armies now, not even the Russians, advocate volley firing within effective ranges, and that independent firing is then the rule, as good volley firing becomes impracticable. The number of rounds being specified, independent firing should be perfectly under control with highly disciplined troops. That is about the only point that I have observed where there is any conflict with the Drill-book. I would also wish to notice in connection with the attack, that we require to practise skirmishing much more, and I understand that since the Tirah campaign regiments in India are doing so to a considerable extent. It should always be remembered that quite independently of the attack there are small detached operations as well as all the work preliminary to the attack, driving advance parties of the enemy out of broken ground, villages, plantations, and so on. All this requires first-rate sharpshooters and skirmishers, and we have been too apt, I think, latterly in our Army to devote all our time to

practising the attack, and to neglect entirely the art of skirmishing. Those are the only points on which I wish to make any observations.

Colonel LONSDALE HALE (late R.E.):—I should like to ask the lecturer a question, as this deals with the training of a battalion for attack. I notice that in the paper, speaking of the success of the advance of a battalion, he says, "Considerable difference of opinion exists, or perhaps I should say did exist, as to the size of the unit by which the successive advances should be made. 'On service' the question will sometimes settle itself, as the stress of the enemy's resistance will not be equally felt all along the line. Those portions of the attacking line which are most favoured by the ground, or which from any other cause feel the strain least, and have in consequence the greatest amount of energy remaining, will often take the lead, and thus draw the bulk of the enemy's fire in that part of the field on themselves, as the greatest danger to the defence. With the pressure thus diminished, the rear portions, temporarily checked, will be enabled to advance under cover of the fire of the most advanced portions of the line, and so on. But as it would not do to rely on a chance impulse of a portion of the firing line, it is necessary for war, as well as for instructional purposes, to have some system of advancing. The most suitable appears to be successive advances from a flank of half the firing line at a time." You yourself are training the infantry battalion for battle; you have in your paper pictures which we all know. We all know why it is that firing lines cannot advance, as you very properly say. It is only when you come to read the battles of regular history—in the latter period in detail—that you find hardly any two companies ever do the same thing on the battle-field. If you look at Aldershot, I cannot recall from all my long experience, nor do I think any other gentleman here can, any instance where the companies did not do exactly the same thing. Every single company does exactly the same; it advances to the attack, it adopts the same formation, it is supposed there is no more cover for one company of the fire line than for any other, or more fire brought to bear upon it. You will find from one end of the valley to the other the companies act exactly similar to each other, every company is doing the same thing. You yourself have said that that is not the way in which the companies of a battalion advance in war. Some are able to go forward, and some are checked on account of the firing. You battalion officers say you want a system of instruction; then why do not you adopt it? Why do not you, when you have your battalion out, go to your first line and say, "You will not advance by half-sections"? Why do not you say, "You are all checked, you cannot get on"? Why do not you simulate that on your parades? I am a humble sapper, and know nothing about it. I am merely asking for the purpose of instruction. Why do not you, in your instructions, simulate what you yourself have said is the actual phenomenon of the battle-field? Instead of that, you jump off at once. I was in great hopes when I read the paper that you were going to give us something of real instruction, but you slid off. You say, "This is what happens on the battle-field; but we want instruction in something which never happens at all; we will go forward in half battalions." I humbly suggest to you, Sir, that war should be simulated, that the battle-field should be simulated more than I have ever seen it done at Aldershot. I thought you were going to suggest that in your lecture, but unfortunately instead of that you have said you would do something which you say never happens at all.

Lieut.-Colonel E. GUNTER (late East Lancashire Regiment):—I cannot speak as an authority on this subject, but I think every member of this Institution should testify his thanks to the lecturer for the very able lecture which he has given. He has touched upon a great many points, which, without going outside the Drill-book, are of very great importance. With regard to the question of reinforcement: I think it depends upon the strength of the

firing line, whether half the firing line should go forward at a time. If half the firing line went forward at a time it might form a very large target. I think that most depends upon the circumstances of the case. I am very glad the lecturer has drawn attention to the importance of practising "casualties." I do not think, from what I have seen, that it is half enough done. The system which the lecturer proposes seems a very practicable one. I do not quite understand a paragraph at the end where the lecturer says:—"'Casualties' should remain on the ground where they have fallen, until the whole of the first (or second line, if there is one) has passed them, when they should rise and place themselves under the command of an officer and non-commissioned officers detailed for the purpose, who will re-organise them and lead them forward to the fight." Does not that remind us of some of those plays where the instructions "falls and dies," as regards all the principal persons in the performance, are given, and then afterwards, when the curtain goes up, they all come forward again and make their bow? I think if you want to introduce reality you should avoid unrealities. Those who have been killed or seriously wounded would hardly be able to form up and go on with the attack; and you would appear to have more men in the final assault than you actually would have. Would not that lead to unreality? The question of volley firing, of course, is a very important one. I hope the characteristic coolness of the English troops will enable us to keep up volley firing, notwithstanding all that Sir William Cameron has said against it as to its being done away with by foreign Powers; and I think it is possible, if the men are well trained, to deliver volley fires up to within 500 to 400 yards of the position. During the series of attacks by the Ghazis at the battle of Ahmed Kheyl some of the companies fired volleys up to about 400 yards. I quite agree with the lecturer in regard to the word "cavalry." I think it is a pity directly the word "cavalry" is called out that squares should be formed. The men should be taught that there are many situations where they need not form squares, and I think that rushing into rallying squares has a demoralising effect. He says, very properly too, that more stress should be laid and more practice should be given to the infantry in using the bayonet, so as to let them have full confidence that each individual infantryman can match a cavalryman when he comes up. I think that should be done, but I hope the authorities will consider the question of giving them a longer bayonet than they have at present, as with this small bayonet the men will feel themselves very much at a disadvantage. With regard to fixing bayonets, I quite agree with the lecturer, that it is a pity if the men are prevented fixing bayonets as they run, supposing they are in extended order, in "rallying square," or whatever you call the formation. I do not think the words "rallying square" should be used, as the word "rallying" implies there has been a defeat, so I think you might leave out the word "rallying" if you can. The men should be allowed to fix their bayonets as they are running in. The mere fact of the bayonet when it is on lowering the projectory is a matter of very little importance at that close range, but it is of vital importance that the men should have their bayonets fixed and ready. It does not matter whether you allow it by regulation or not, because, practically, the men will do it. So that I think it would be better that it should be authorised by regulation.

The CHAIRMAN:—I will now ask the lecturer to reply to the criticisms which have been made.

Major Sir ROBERT COLLETON, in reply, said:—Sir William Cameron spoke doubtfully of the possibility of maintaining volley firing. My authority for saying that the Russians maintained volley firing was an article in the *United Service Journal of India*, of April, 1896, which gives the principal heads and the methods of attack of the different European Armies. What I have said about it is almost a quotation from that article. With regard to the possibility of maintaining volley firing, it seems to me there are very great reasons for its maintenance, as I tried to point out in the lecture, the great one being the economy of ammunition. There

is also another reason, that although we may not on service be quite able to do what we should desire to do, still it is very often advisable to aim at a higher standard when you are training men than you expect to maintain actually on service; and therefore I think if we train men to expect that they must keep up volley firing to a late period of the attack, although they may not be able to reach our standard, yet they are far more likely to fall less short of it than they otherwise would do if we gave them the impression, in time of peace, that it was utterly impossible to fire volleys at all. Colonel Lonsdale Hale said that he thought on a peace parade we ought still to leave the initiative for the advance to a chance impulse of a part of the line—as far as I understand him, by naming certain portions of the line from time to time to lead the advance during the progress of the attack. It seems to me it is rather important to prevent confusion, to have as little talking as possible when you are carrying out the attack in this way, and it is purely an instructional business. Of course on service, as I said, the matter would probably be settled by the people who would feel the strain the least; they would probably be the people who would advance. But at peace parade it is very difficult to simulate those conditions.

Colonel LONSDALE HALE:—Why do you teach them to go forward on mathematical principles in peace-time, when you yourself say that mathematical principles do not rule the practice of war?

Major Sir ROBERT COLLETON:—I quite see Colonel Hale's point, but the difficulty is that his suggestion is rather hard to carry out.[1] With regard to Colonel Gunter's objection to the casualties getting up and being brought forward again, that is purely a matter of choice. Of course, if they die once they cannot die again; but again it is a question of a peace parade. Those living men who have fallen out as casualties, perhaps 1,500 yards behind, would lose a very great deal of instruction that is going on if they were left idle, and if you can tell off somebody beforehand to bring them on again they get an opportunity of gaining instruction. They need not necessarily be used. I think they are all the points to which I have to reply.

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[1] I did not attempt to formulate a new method of attack, but to discuss the best method of carrying out the Regulations as they exist. The method advocated by me of an advance by alternate halves of the firing line seems to be in accordance with the teaching of "Infantry Drill"—*vide* Sec. 53, pp. 66 and 67, and Sec. 124, para. 10; and also the Musketry Regulations, Sec. 191 (*a*), page 108. As regards the advisability of training men in peace to advance on mathematical principles, *i.e.*, by alternate portions of the firing line, the practice is sanctioned by high authorities other than the compilers of the Drill-book. It is recommended by Major Maude in his "Letters on Organisation and Tactics," and by Prince Kraft in his "Letters on Infantry." The latter in Letter XII. says:—"The best way is for part of the skirmishers (say half) to advance covered by the fire of the remainder. . . . ." Again, a little further on:—"In the case of a battalion, the best plan is for the battalion commander to give orders which wing of the skirmishing line is to begin the advance by rushes, and let this be adhered to." The above might be treated as an academic and theoretical opinion, if it were not supported by a quotation from practice. In Letter X. the Prince describes the attack on Le Bourget (October 30th, 1870) by two battalions of the Regiment Franz, when the first line advanced by rushes of alternate wings, the advancing wing being covered by the fire of the halted one. The Prince recalls "his jubilant feelings at witnessing the success of this well-planned and steady attack," and rejoices at the small loss suffered by the regiment until it reached the *lisière* of the village. It appears from the above that the Prince did not consider the manœuvre as impracticable in war, and that he therefore inculcated this method of training on peace parades.—R. C.

The CHAIRMAN (Major-General J. B. Sterling):—It is the custom of this Institution that the Chairman should make a few remarks with regard to the lecture over which he has presided. But it has been my constant view that the Chairman should be a neutral, leaving the criticism or the agreement with the audience before him. On this occasion Lord Roberts had undertaken to take the Chair, and I bitterly regret his absence; as if he had been present we should have had the benefit of the criticism of one of the most practised soldiers in the world with unequalled experience and knowledge of this subject. In mentioning the Drill-book, which Sir R. Colleton has done, there are some points which struck me in the new one that has come into force since I gave up the command of a regiment. I saw it with some regret. I am not surprised to find that the necessities of India, not for the first time, have been somewhat neglected for the considerations of Aldershot. The British soldier has, perhaps, the hardest task to face of any soldier on the face of the earth. He is staying, in peace-time, in a civilised country; he fights in the desert and on the Himalayan spurs. The skirmishing that has been instilled by skilled officers on the North-West Frontier in this late campaign in their brigades bore fruit a thousand-fold. It is a necessity to train for mountain warfare. The European nations realise it, those that have mountain frontiers have mountain corps. We alone conduct solely a close-ordered drill in the system of attack, and the paragraph on skirmishing, which is of supreme value under certain circumstances, is eliminated from our Drill-book. I regret it, and I think our troops have suffered from that circumstance. On the whole, although I have stated that I wish to be neutral in the matter, I must sincerely compliment Sir Robert Colleton on the very careful paper which he has read to us. Although it is not a paper which will meet with general interest, it is one that ought to do so from a great many people in this country. Beyond the ranks of the Regular Army, you remember, we have a large Civilian Army who are brought together for temporary purposes, and may be brought into the field for actual war, for good or for evil; these stand between us and conscription. I regret the smallness of the audience here, but you must remember that when a paper is read in this Institution it is not only the score, or the score-and-a-half of people who hear it, who are interested by the discussion; our words are printed. The larger portion of our members are serving their Queen and their country from Canada to the Falkland Islands, from the Himalayas to New Zealand, and every one of those skilled officers who have been kind enough to speak on this question receives an audience a hundred-fold as great as those here present. I think I shall have your feelings with me when I return the sincere thanks of the audience and members of this Institution to Sir Robert Colleton for his carefully prepared paper.

N.B.—With permission of the Council, I would wish to add to what I said at the lecture that, in my opinion, as often expressed in official reports, there is in our Army an indiscriminate use of volley firing during the greater part of the attack, no matter what the object aimed at, which I fear would be seriously prejudicial to our efficiency on the battle-field—I mean a European battle-field. Our Drill-book clearly indicates that volley firing is to be used against *closed bodies* of the enemy, and consequently it is inapplicable to thin skirmishing, or scouting lines, or small parties of the enemy moving in more or less dispersed order. Moreover, when under heavy fire and moving over rough ground by alternate rushes, the men coming up irregularly, fire would naturally be opened by them independently as they reach the new firing point instead of having to wait until all have struggled into position before volleys can be fired. So also when there has been a certain mixing up of the units after the firing line has been reinforced, good volley firing is hardly practicable. Neither should it be forgotten that volley firing is not continuous in the same degree as independent firing, and that the latter is generally more applicable to a rapidly advancing enemy. Lastly, it should be borne

in mind that the great disadvantage of volley firing is that its effectiveness depends chiefly on the efficiency of one man (the leader), and that if he gives a wrong distance, or the executive word "fire" is given at the wrong moment, the volley is useless. How very erroneous are the distances named, and how frequently ill-timed the volleys, I have seen over and over again at innumerable field-firings and manœuvres—in fact, the word "fire" is often given just as the enemy is, for the moment, disappearing under cover. That good volley firing under proper conditions is most destructive, both to the morale of the enemy and the losses inflicted, is admitted to the fullest extent; all I wish to establish is, that to use it almost exclusively in the attack as at present (the very last stage excepted), would be a very dangerous system to adopt against skilled riflemen in South Africa and European Armies. All this I would have said at the lecture, but considered the only question raised on this part of the subject was: how long it is possible to maintain volley firing in the face of the magazine rifle in the hands of a highly trained enemy.

THE JANE NAVAL WAR GAME.

By F. T. JANE, Esq.

Friday, June 17th, 1898.

Vice-Admiral Sir WILLIAM R. KENNEDY, K.C.B.,
in the Chair.

I THINK that I should begin this paper with a short statement of what the game aims at doing, and what it does *not* attempt to do. Certain postulates are necessary.

First, as to what it aims at doing: It is an attempt to supply for the sea what Kriegspiel supplies for the land forces—a means of fighting battles in miniature. To do that, a great many things have to be included, certain conventions have to be adopted, and on the elasticity and realism of these conventions everything depends. Into their details I shall enter later; it suffices here to remark that the vital need of making the game *interesting* is, to a great extent, the cause of these conventions. A game that only a few eminent enthusiasts would care to play is of no use at all, because no game of any sort could teach them anything. I do not by this mean to suggest that the game aims at teaching his business to even the most junior officer; but it *is* produced with a view to leading to the study of certain problems that are not likely to come in for consideration by salt-horse otherwise. It is designed to be of some sort of service to junior officers. For instance, an officer who had played with the "Bouvet" two or three times in this game would have a far clearer idea of her strong and weak points than one who had merely the ordinary familiarity with her plans and statistics. The actual sum-total of knowledge might be the same, but, in the former case, the knowledge would have been to some extent already applied. No man playing an action likes to lose it, and he will easily remember the weak point, the false move that made him lose. If the rules approximate to actual conditions, then a field for a new method of studying "discriminating fire" has been opened. This particular subject is perhaps the chief one of the game—its idea is to *individualise*; actual ships, guns, armour, projectiles—all these have been differentiated. Again, the question of "rushing to close quarters" is more easily worked out with the game than on paper, because in the game there is the ever-present fact that the enemy is *doing something at the same time*—a fact that paper calculations may unconsciously omit or slur. It is easy to multiply instances; these are merely thrown out as suggestions. For their solution they depend only upon whether the game is or is not sufficiently like the "real thing."

Secondly: there remains to be tabulated what the game does *not* attempt. It seeks to avoid anything that may be described as a fad, or a theory. It, I hope, most entirely avoids anything of the nature of even suggesting what ought or ought not to be done; it seeks to reproduce conditions only, leaving results to the individual players.

From this preface as to the limitations that I have sought to maintain, I will pass to a consideration of the principal rules.

Each move occupies one minute, and must be made in that time; all moves are simultaneous, and no consideration is allowed.

The game is played upon squares, each of which represents half a cable. These squares are so arranged that the size of the board is in no way restricted, unlimited sea room being, of course, necessary in most cases. The fact that the diagonal of a square is greater than its length is, for simplicity, ignored. It has been found to make little or no practical difference, and such advantage or disadvantage as there may be can well stand for fluctuating engine-room efficiency. It is, however, possible to play by exact distances if desired.

The pieces are on scale with the squares, the heavy ship being characterised by an excess of beam. These pieces are fairly accurate little models of actual ships. This is essential, as it is for players to discover, as best they may, the enemy's name, and hence his fighting value.

Speed is in 3-knot units. Half a cable (the size of the squares) being the space traversed by a 3-knot ship in one minute, this unit scales easily with the game. Smaller differences are allowable, but as a general rule they are apt to cause confusion without advantage. It may seem a big drop from 18 to 15 knots, but nearly every first-class battleship is given 15, a better status-keeping speed, possibly, than most of them can manage. Cruisers have generally 18 knots; a few, like the "Powerful," are given 21; destroyers 24; and in a few cases 27. Second-class battle-ships are allowed 12 knots. For all general purposes this scale answers very well; I felt it would be a mistake to cumber the game with delicate differences in speed—which anything less than a 1½-knot difference in a move very certainly is.

Turning, again, is a convention. The diagram explains it, perhaps, better than words can. The root idea is that a ship loses speed by putting down her helm. I believe that the actual loss averages about 15 per cent. and in the game it is about 30 per cent. The loss being the same for both is, however, of small moment. It was necessary to have a simple rule—the loss of a square for each four points turned is easily remembered, and embodies the essential fact. With engines, eight points can be turned, but four squares are lost. Here again the loss is excessive; but, as the time distances of circles are thus made the same, the actual thing is paid attention to sufficiently for practical purposes. The usual distance allowed for answering helm is the cable (two squares), and here the model piece has possibly an advantage over the real ship—counterbalancing the excessive loss of speed for turning. The circle (owing to the squares, it has an octagonal form), has, approximately, the same diameter as the circle of the Admiral class. Certain ships, long cruisers

like the "Powerful," and destroyers at full speed, are less handy, being allowed to turn on every third square only. Ships like the "Thunderer" or the "Yashima" are allowed to turn eight points on the second square instead of four with extreme helm. From this it will be seen that, subject to convention as regards every individual ship, there is yet a field for manœuvres between handy and unhandy ships.

Every piece is mounted on a stand, on which her speed and turning capabilities in squares are printed. On this stand there are three small buoys, red, green, and black. The red or green should be dropped at the moment helm is put over, according to whether the projected turn is to port or starboard; the black is used only when ships are near together and if any question as to the square left is likely to be raised, it is then dropped on the square left. Both red and green are dropped when

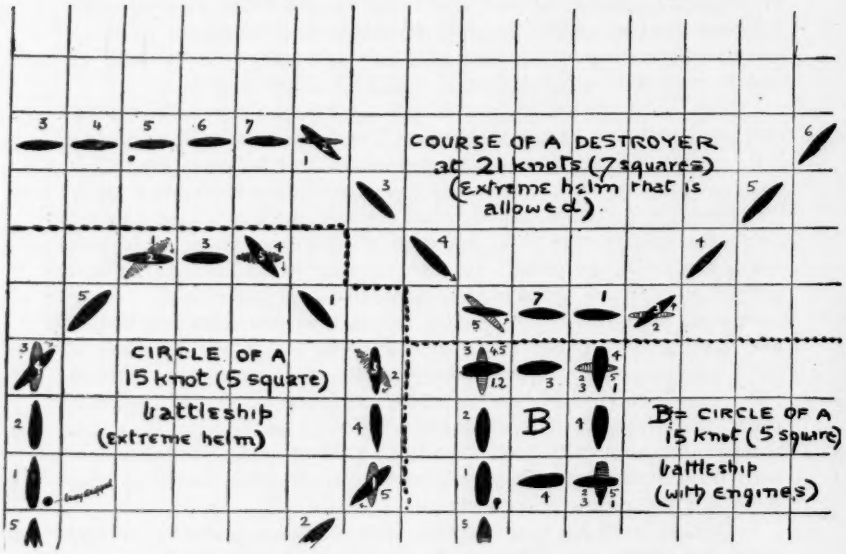


Diagram to Illustrate Turning Circles Showing Loss of Squares for Turning.

The figures indicate the order in which squares are covered during each move.

both engines are reversed. The game is, however, generally played without this feature. I had a sort of tiller fitted to ships once, but that was not satisfactory. A weak point of the game which these coloured buoys obviate is that, without some such indication, a player's movements are not always controllable.

Further rules as to speed and so forth are:—A ship may stop dead (reversing engines) in one move. If stopped, she gathers way, one square the first move, two the next, and so on; never more than an increase of one square per move (100 yards in a minute) is allowed. These are conventions, but in practice they are quite satisfactory.

By these rules, unless there is a considerable advantage in speed, ramming is exceedingly difficult. That, I believe, is in accordance with history. The game difficulty lies in the immense amount of judgment required. An advantage of 6 or 9 knots is generally necessary, and success may then be doubtful so long as the enemy has steering way. A ship doing 9 knots has, however, been rammed by one doing 12—the rammer was a Russian officer who had never seen the game before. It was purely a case of skill and judgment—a very pretty manœuvre, and a solitary instance.

The gun and torpedo remain to be dealt with. For guns I have employed a letter notation based on muzzle-energy for penetrations, on calibre for destructive power with shell. It is identical with the notation I adopted as an *aide-mémoire* in "All the World's Fighting-Ships"—the guns A, B, C, D, E, and F for 12-pounders, the armour *a*, *b*, *c*, *d*, *e*, and *f* for thin shields. *a* armour is, except at near ranges, proof against all except the A gun, *b* against all below B, and so forth. The French 10·8 is the smallest calibre gun in the A division—which includes all pieces of over 20,000 tons muzzle-energy. In B come the old 45-ton 12-inch B. L. the 30-calibre 11-inch German guns, our 10-inch and 9·2 wire. In C division the 9·2 of the "Edgar" class and 8-inch guns. D consist of 6-inch Q.F., old 8-inch guns, 5·5 Canet Q.F., and so on. E are 4·7-inch and thereabouts. There are sub-divisions in each class for game purposes. Armour is classed *aaa* for 30-inch iron or its equivalent; *aa*, about 24-inch iron, 18-inch compound, etc.; *a*, 18-inch iron or 9-inch Harveyized; *b*, 15-inch iron; *c*, 12-inch iron or 6-inch Harveyized; *d*, 9-inch iron; *e*, 6-inch; *f*, thin armour. Some sort of generalisation was absolutely necessary. To attempt to differentiate between, say, 18-inch compound and 17-inch would be but to dig innumerable pitfalls—safety lies only in approximation. The usual rule-of-thumb reckoning, 2-inch iron = 1½ compound = 1-inch Harveyized, has been adopted up as far as medium Harveyized plates. Thick Harveyized have been calculated as only a little better than compound. All these guns and their penetrations are printed concisely upon small cards, so that no memory effort is required.

In playing the game, armour-piercing shell are given penetrations generally two grades less; common and high-explosive shell are limited to *d* armour. These are all calculated for ranges of one, two, three, four and five thousand yards; from the 16-inch 110-ton down to the 3-inch 12-pounder. The damage done by the various shell, reaching from 250 by 6 feet for a 16-inch high explosive down to a few feet for the 3-inch, are also calculated on the card. The penetrations are for within 30° of the normal; if the angle of impact is greater than that, the penetration is a grade or more less.

I need hardly say that this scale of penetrations does not rest upon my choice and selection, but has been most carefully gone into by gunnery specialists. Some Japanese officers who have had very practical experience of modern gun-fire, have also kindly rendered assistance. Everything, in fine, has been done to make the gunnery as approximately

accurate as possible, and the effects of gun-fire upon various structures are largely tabulated in the rules.

There are, of course, very divergent opinions as to the effect of gun-fire. In the rules of the game the attempt has been always to attain the mean.

For instance, the case of shell bursting under the barbettes of, say, the French "Magenta," or, for that matter, the majority of foreign ships. There is, I believe, a pretty general theory with all officers not gunnery specialists that a single shell will bring the barbette down. There are a great many specialists who believe nothing of the sort, holding that no shell could be got, except by lucky chance, to burst sufficiently near the floor of the barbette, and that a good deal of damage will be necessary to obtain a serious result. I understand that a shell did actually burst under the big gun in one of the "Matsushima" class at Yalu. It knocked everybody silly in the barbette, but after some delay the gun was able to go on firing at a slow rate. The rules are arranged to give such a result; and a barbette is allowed as brought down, only if the structure all around is also damaged, and more than one shell bursts directly underneath.

The problem of shell-fire has been treated in the following manner: The Palliser shell has been taken as a unit, and always assumed to burst, or else carry through fragments enough to have the same result. All other shell, against *armour*, are assumed to do damage as Palliser, and so is solid shot against thin and medium armour. Normally, against unarmoured structures, common shell do double what an armour-piercing shell of the same calibre is allowed, while high explosives do a certain percentage more. A further difference is that while Palliser and common do damage on the far side of the battery, and are assumed to totally disable guns in the radius of explosion, high explosives do their damage on the fighting side, and mainly affect the *personnel*—silencing guns for five moves only, and, at option, affecting their subsequent shooting to some extent. For this simple generalisation of shell I am indebted to the suggestion of Captain H. J. May. In earlier stages the differentiation of shell was of a very clumsy and complicated nature; now it is at least eminently *workable*.

Solid shot against thick armour, or unarmoured parts, do about half the damage allowed to Palliser shell. Should they *rake*, however, there is no limit set to their damage save a thick bulkhead. Common and armour-piercing shell are allowed double the destructive power for a clear rake; high explosives nothing extra.

For damage at the water-line, or to the uptakes, some speed is lost—an attack often made use of against a soft-ender. There are rules to cover all questions likely to arise under this or kindred heads, sufficiently close to the real thing not to need tabulating here.

Perhaps the question now most present with you is, How is the situation of a hit defined? This, being the most prominent feature of the game, I will endeavour to explain it in detail. I should first mention that every individual ship is divided into areas—laterally, by its decks; vertically, by lines every 25 feet, reckoning from the bow. These are drawn in three sizes—on a scale, each section $\frac{1}{16}$ inch for 4,000 yards range,

⅛ inch for 3,000 yards, ¼ inch for 2,000 yards or less. I have here a large rough diagram, roughly indicating the principle. There is also an end-on view for each range; for ships at an angle a portion only of the broadside target is employed. This is called the "shooting target." For scoring purposes there is a card identical with the shooting target elevation, save that all armour is marked upon it in the A B C notation, protective decks being calculated at double their value on the slope. Thus a protective deck of, say, 3-inch Harveyized steel, is calculated as follows:—3-inch Harveyized = 6-inch iron × 2 for the slope = equivalent to 12-inch iron—*i.e.*, *c* armour. It consequently is proof against anything less than an 8-inch gun, except at very close range indeed. This scoring card has also a deck plan of the vessel with all the guns marked on it, and these guns are crossed out as they are disabled. I have selected a ship of French type, the "Carnot," as that vessel best lends itself to demonstration.

Hits are noted by a machine such as I now hold. It is a very simple affair, but in the many experimental battles has been found to supply just what is wanted. There is no certainty in hitting—results depend on a sure eye and keeping cool. I believe, however, that it must be used to be appreciated; at first sight, I admit, the look of the thing is not promising.

Allowance must, however, be made for chance, and if possible for the individual personal element; with this device that is secured. Direction is a great deal easier than elevation; the variety in aiming power between players gives an equivalent to good or bad gunnery; and, finally the thing is so contrived that a very little hesitation or excitement produces wild shooting. For instance, directly a ship is badly hit, an accurate return fire increases in importance. It so happens that the more care that is taken in striking, the greater is the probability of a miss, consequently by a curiously indirect means we secure some vague approximation to "moral effect" of shell-fire.

I make this statement with all diffidence, but it is based upon my observations of something like 50 different games. This striker, then, embodies a serious attempt to produce some equivalent for the moral effect of shell-fire, and it succeeds approximately. The difficulty of a certain hit is secured by:—

1. The position of the pin, which is never in the exact centre, so that where it will hit has always to be calculated.
2. The big flat head, hiding the target or the greater part of it at the moment of impact.

The unit of damage is that done by one minute's fire from a 6-inch Q.F. with common shell, say four shots. That is one section destroyed. A 4·7-inch in one minute does half that; an 8-inch the same as a 6-inch Q.F., an 8-inch Q.F. about half as much again; and so on, on an ascending scale for greater guns. The rates of fire of big guns are scaled: a 110-ton 16-inch firing only once every five moves, a 13·5-inch every three, a 12-inch wire every two. These rates are perhaps a trifle too fast; they

are made so to prevent a battle taking too long to play, and are to be lengthened at option, of course.

In firing there is a differentiation between the big gun and Q.F. The latter are struck, one strike for each gun in rapid succession, without any inspection of the target between the shots; the big gun is struck for singly. In practice this works out as it should do; shooting comes easier with the Q.F.

Torpedoes are arranged for on a scale of chances. Above-water and boat's tubes are on this scale. At 500 yards, 1 in 6; 400, 2 in 6; 300, 3 in 6; under 300, 5 in 6. Our submerged tubes the same, but foreign submerged tubes only 1 in 6 at 400 yards; 2 in 6 at 300, and even chances below 300. The new Elswick tube is given a mean between these two. This scale of chances embodies not merely the question of hitting, but allows for the torpedo being fired too soon or the range being miscalculated to some extent. They approved of the scale in the "Vernon." Torpedo craft are fired at much as ships are—little scale drawings being provided. A strike is allowed for each 12-pounder, three 6-pounders, or five 3-pounders. For 1-pounders, Maxims, etc., one single extra strike is allowed; this strike is assumed to affect *personnel* only—it might, for instance, by pure chance, hit just at the tube where the firer would be. Torpedo-boats are compelled to observe all actual conditions, but they are not subjected to any fancy rules such as the two minutes' fire to destroy of naval manœuvres, which, I believe, is very generally considered unreal. At one time fire was settled by a dice throw, but I abolished this as unsatisfactory. For night attacks the range is increased according to the darkness, a 4,000 yards target being used perhaps when the boat is within 1,000 yards. This very well renders the increased difficulty of hitting. The firing range is 2,000 yards or less at night, 3,000 in daylight attack. A torpedo is not allowed to score against a ship end-on in motion; there is, consequently, a big field for manœuvring in a torpedo attack.

If a ship has loaded her above water-tube she runs risk of the torpedo being exploded should she be hit in the torpedo-room; even chances with common; 4 in 6 with high-explosive shell. A good many players do load tubes in action; hits in the torpedo-room are not very frequent. Occasionally a tube has been hit and an explosion scored.

I should, before this, have mentioned that one player one ship is a most stringent rule. One piece is quite difficult enough to manage. There are ample rules as to signals, guns not bearing, ramming, boarding, and so forth; an effort has been made to include *everything*.

In connection with the Tactical Game, there is a strategical one that I need only refer to briefly. It allows for weather, food supply, commerce attack and defence, scouting, combined naval and military operations, sighting, obtaining and carrying information, coaling, obtaining stores and ammunition, ammunition supply, and all kindred things. Rules for Brennan torpedoes, pneumatic guns, and submarine boats are also introduced. Its main feature is that everything is on a scale of *costs*, points being assigned for everything. For instance, a town is worth, say,

50 points. To destroy it 25 points of ammunition have to be expended; certain risks run of capture by defending ships that may be near; and coal is, of course, expended in reaching the place. Therefore the enemy loses 50 points, while the attack loses 25 for ammunition, 1 or 2 for coal, and runs certain risks that may or may not counter-balance the 23 points that the defence is to the bad. So, too, in commerce attack, merchantmen are a tempting prize, but each prize-crew is counted as a gun out of action to the captor, and the capture is to be got into port.

The object of giving this strategical game is principally to afford a means of tactical games "coming naturally," as it were; and on long sea cruises it may afford an interesting exercise in a large mess, or between two ships of a squadron. It contemplates small "wars" on naval manœuvre lines, but it is quite adaptable to a war between any two countries. The rules are simple and ample, and easily mastered.[1]

In conclusion, it may not be without interest if I state certain results that have been obtained in games played in various of H.M. ships. The results sometimes do and sometimes do not consort with generally accepted theories.

1. One big battle-ship has always proved more than a match for two small ones. So far as the game is concerned, the plea for "moderate dimensions" is altogether out of court.

2. It is relatively easier for six ships to defeat four, than for nine or ten to do so, and against twelve the four might have a very good chance, because if well manœuvred they can easily throw the twelve into confusion. This curious result has happened several times, so I deem it worthy of mention.

3. Cutting the line is every bit as effective under steam as sail. This, when accomplished, has invariably resulted in the total defeat of the enemy.

4. With equal forces, the odds are rather that one will be annihilated, and the other little hurt. Some quite slight tactical error has usually been the turning point.

5. Line abreast is the best formation in which to go into action. Line ahead means the destruction of a fleet in detail.

6. Firing by individual selection is far more satisfactory than concentrated and organised attack by signal. Signals are apt to be misunderstood, or the enemy by a change of formation may nullify everything.

7. For *all-round* purposes the "Majestic" is the best type of battleships, but the "Trafalgar" for some is every bit as good. The French "Bouvet" type is very little behind. The single gun positions are a heavy advantage, counter balanced, however, by the easily damaged disposition of Q.F. and big gun turrets close together amidships.

8. Given on both sides a determination to seek close quarters, there is nothing like the Italian type with 100-ton guns; but they have no staying power at all.

[1] Since the publication of the game various improvements have been suggested and are at present under trial for strategical purposes. Special attention is being paid to coal endurance, and the amount consumed at varying speeds.

9. The "Powerful" has invariably disappointed expectations concerning her fighting power. The Admiral class are the most unsatisfactory battle-ships.

10. Thin gun shields are shell-traps, but exposed guns are little better off. Both are liable to be selected for a persistent shell attack from small guns.

11. A remarkably high percentage of results has been obtained by a continual Q.F. gun-fire with high-explosive shell directed against the muzzles of big guns.

These notes may serve to give a general idea of the scope of the game and the detail into which it enters. Of course, I do not claim that battle results need necessarily be the same.

I do not think I should close without publicly expressing my great indebtedness to a number of naval officers who have interested themselves in the game, and taken endless trouble in connection with it. In particular, my gratitude is due to Captains H. J. May and Prince Louis of Battenberg; and Commander H. R. Robinson, of our Navy; Captain the Grand Duke Alexander, Russian Navy; and to Lieutenant Kawashima, of the Japanese Navy, who has particularly assisted me with the strategical game.

PARTICULARS OF A GAME PLAYED BY THE WARD-ROOM OFFICERS OF H.I.J.M.S. "TAKASAGO."

The game of which details are given below is of interest in that it may be taken as affording some sort of index as to Japanese views upon tactics. The whole of the players were Japanese, and with one exception belonged to the "Takasago."

The rival fleets were made up as follows, and went into action in the order in which they are placed:—

RED.	*Speed allowed.*	*Played by*
"Royal Sovereign"	15 knots.	Commander Katsuhiko Hirose.
"Powerful" ..	21 ,,	
"Vizcaya" ..	18 ,,	
BLUE.		
"Fuji"	15 knots.	Lieutenant Itsibashi.
"Takasago" ..	21 ,,	
"Chin Yen" ..	12 ,,	

Red went into action line ahead; Blue in an indented line with the "Takasago" in the centre. Fire was opened at 4,000 yards, both fleets being then slightly bearing away from each other. At this range Blue failed to secure any hits, but the "Takasago" was struck in the bow, and ordered to take cover behind the "Fuji." In doing this Blue's formation was altered, and the fleets began to close. The "Takasago" still fired, but, being now masked by the "Fuji," her fire was adjudged to have blown away the stern of that ship.

After this she dropped a little astern, and by signal steered out of line, right across the bows of the "Chin Yen" and straight for the enemy, who were at that moment altering course to starboard. She was seeking a torpedo action, but the attempt was a dismal failure. Subjected to a raking fire, her bow and conning tower were blown away, and soon afterwards, long before torpedo range was reached, a loaded tube was hit, the torpedo exploded, and the "Takasago" sunk.

About the same time, the "Fuji" suffered heavily from the fire of the "Royal Sovereign," losing her fore barbette and conning tower, and getting a bad hit on the lower deck where the thin armour is peculiarly liable to damaging shell attack from big guns. The "Powerful" at the same moment wrecked the "Fuji's" bow with her entire broadside, and the ship was unable to steer. The bursting of shells under the "Vizcaya's" barbettes relieved her from fire from that ship, but the "Royal Sovereign" presently hit her twice in the belt, and a little later she was given as capsized. The "Chin Yen" all this time had escaped untouched. With her above-water tubes loaded she turned to starboard intending to attack the "Vizcaya." A single big shot hit her conning tower, and left her unable to steer for four moves. The "Royal Sovereign" passing astern fired a torpedo that missed. The "Chin Yen" replied from her stern tube and secured a hit in the "Royal Sovereign's" stern. A moment later she was herself torpedoed by the "Powerful" at long range, and went down, thus ending the battle, which was one of the most decisive yet fought.

No fatal damage was sustained by the Red fleet. Beyond being torpedoed, the "Royal Sovereign" was very little hurt, the big guns being untouched and only one Q.F. out of action. The "Vizcaya" lost both big guns and two Q.F. The "Powerful" lost her bow 9·2-inch gun early in the action. The last shot disabled a 6-inch casemate. Her water-line was, however, very badly damaged amidships, and she was almost unmanageable.

Four guns were actually hit in the action.

Both the "Vizcaya" and "Fuji" were hit and penetrated in the belt near the engines, but in both cases the chance of immunity allowed saved the engines from destruction.

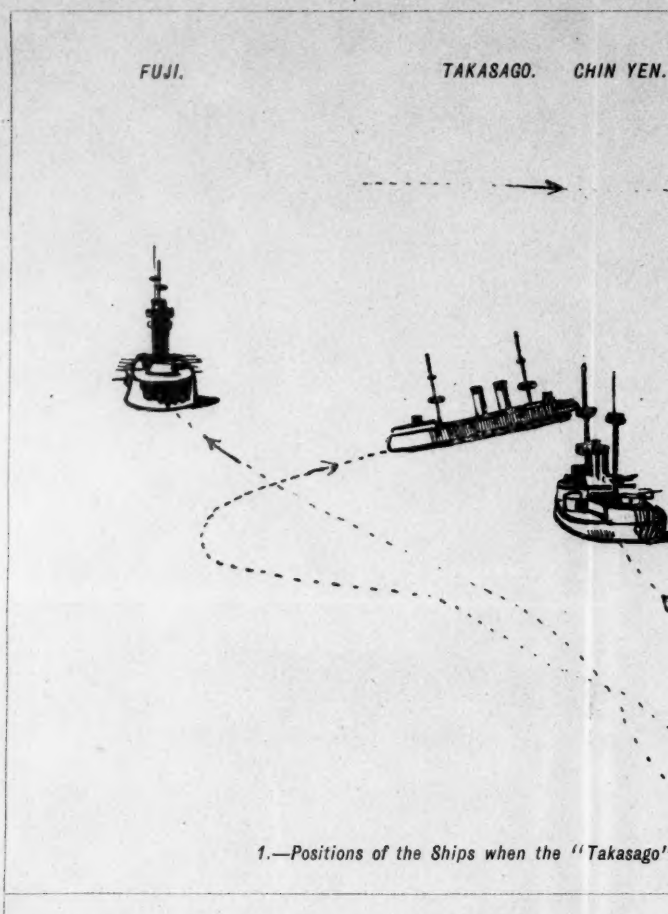
This battle is of peculiar interest in that most of those playing participated in the battle of the Yalu. It will be remembered that that was a long-range affair; in the mimic action under review both sides evinced the common desire to "rush to close quarters" that some eminent tacticians condemn. The erratic behaviour of the "Takasago" is less easily explained. She was, of course, obviously unfitted to "fight in the line." She may have been sacrificed in order to distract the Red fire, or it may have been on the forlorn hope that a successful torpedo was Blue's only chance of ultimate success.

The firing of Red ships was left entirely to the discretion of the individual "captains"; Blue's "captains" concentrated on ships by order. Firing by individual discretion led to both the "Vizcaya" and "Royal Sovereign" firing at the fore barbette of the "Fuji." Both hit,

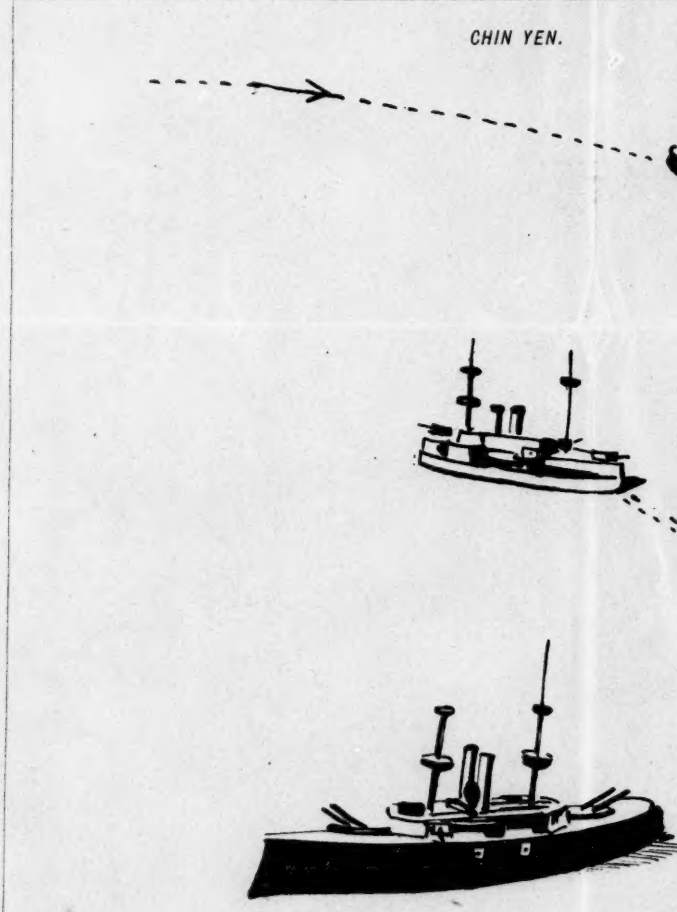
and power was thereby wasted; but on the whole the results were superior to the theoretically better fire control adopted by the Blue, because this control led to many mistakes, and blind obedience to general orders led to the hitting of the "Fuji" by the "Takasago." Throughout the game the rather stringent rules as to signals were strictly adhered to.

Captain R. LOWRY, R.N.:—Having had the opportunity of fighting two of these war games, one a cruiser action and the other a small fleet action, and of watching a third game this morning, I think I may venture to give my opinion, based on that small amount of knowledge, of what the game is likely to be worth to officers of our Service. I consider that it is likely to be a most useful game in some points, that is, it will teach officers, or help to set officers thinking, how best they may use the guns and projectiles in their ships. Again, it will help to impress on our memories the strong and weak points of the various classes of ships of possible opponents. I think, too, that it will help to elucidate some general principles of how best we may use all arms, both in single ship actions and in fleet actions. More than that I do not think it will do. I have not had the opportunity of seeing the strategical game played, but I have read the account of it in the *Engineer*, and I think it aimed at far too much. In my opinion, this game is not likely to be of much use for strategical purposes. If we attempt to learn any ramming tactics from this game we shall not succeed. The moves are on too broad a principle, and too roughly done, to enable us to tell whether a ship would or wou not ram. Ramming is a question of a very few yards, and very few degrees of helm. Whether you ram or are rammed may depend on a very slight increase or decrease of speed or movement of the helm. I do not think that will be shown by this game, or, in fact, in any game where the turning circle of the ship is not accurately laid down. Again, I think this game does not teach us much as regards the use of torpedoes. It can give you a rough idea, and impress on our minds, perhaps, when we may be able to use torpedoes. In actual torpedo tactics the fact of ships only being able to turn (approximately, and all being on a very small scale) makes it practically impossible for them to fight an action at close quarters, that is, to use the ram or torpedo as their chief weapon. With the gun armament, I think it is an exceedingly promising game. I hope in any developments of this game, which is still young, more complications will be avoided. Things like introducing signals with small models of this kind, and that sort of complications, would be out of place, and only make the game more difficult to learn. The game itself is interesting and likely to take on, especially in sea-going ships, and I think it might prove popular and useful at this Institution. If I might make a suggestion to the Council of the Institution, it would be that the game should be kept out in some corner ready for any officer to play at any time he wished. I do not believe that if application had to be made to the Council or the Secretary first, and then a table got out, and half-an-hour or an hour's preparation had to be gone through beforehand, that many officers would use it; but if two officers could stroll in and play a game as they would a game of billiards, I believe a great many would be glad to avail themselves of the opportunity.

Captain H. J. MAY, R.N., C.B.:—The lecturer has been kind enough to mention my name in connection with this game, but I must say I never saw his game until this morning. In trying to study naval tactics in the Pacific, where, although we had lots of sea space and long sea cruises, we had no ships to manœuvre with, I found it was very difficult to get up the necessary interest, and should much have appreciated the materials which Mr. Jane has shown us to-day. Therefore, when I heard that Mr. Jane was proposing a war game I wrote to him to say that I should like to know what his game was, and where it could be



1.—Positions of the Ships when the "Takasago"



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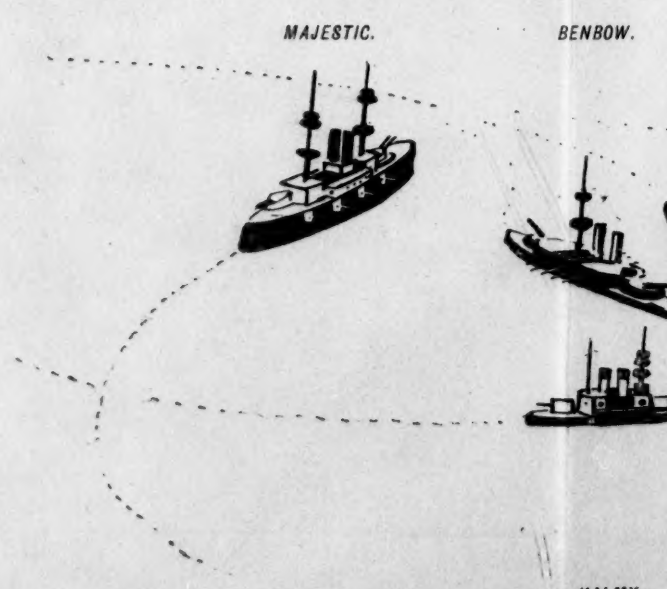
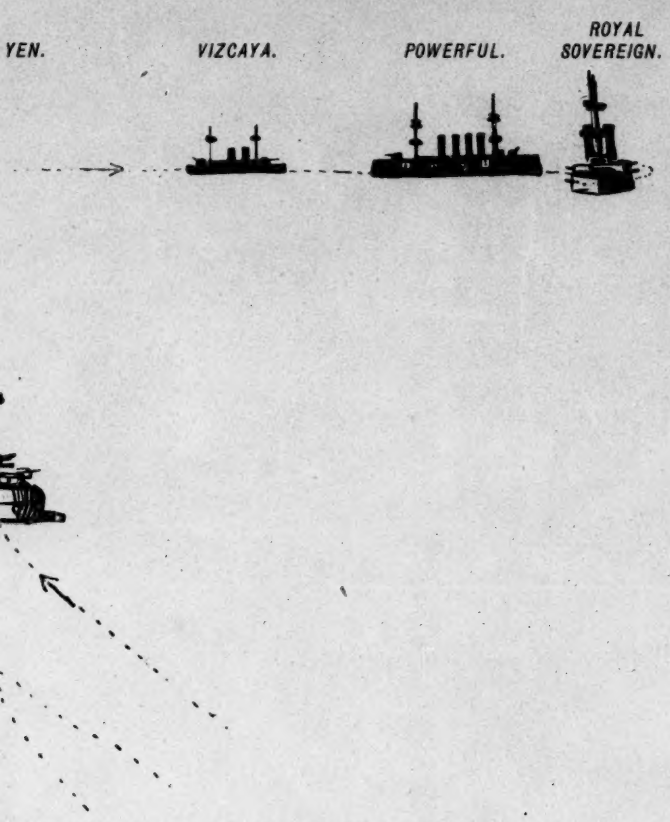
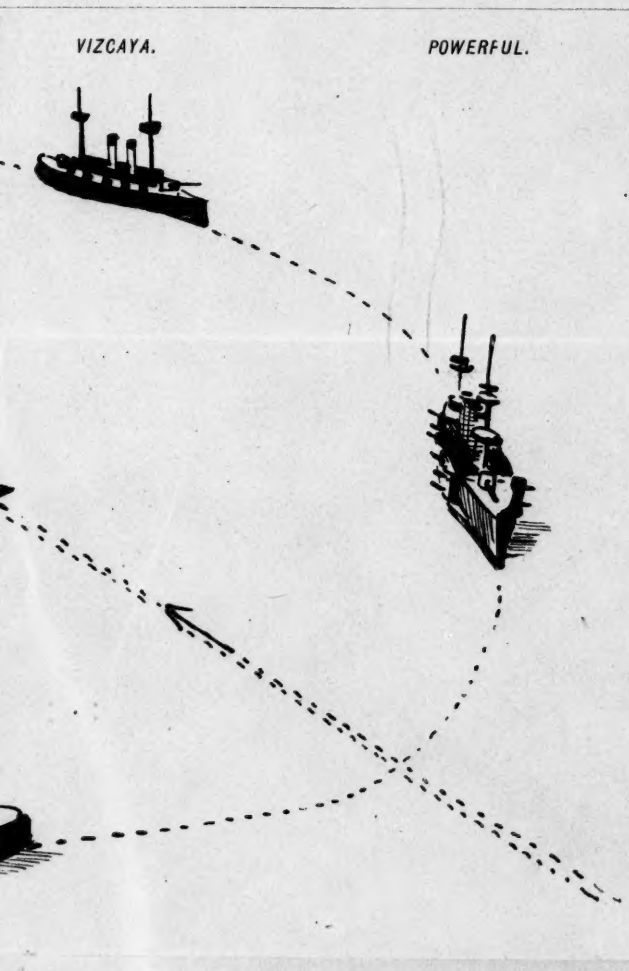


Battle at U.S.I. Positions at close of action. (The "Bo



sago" left the line. (Japanese Officers' War Game.)



"Royal Sovereign" and "Chin Yen" were torpedoed.

IY.

"Bouvet," disabled, lay about 2,500 yards ahead of "Lepanto.")

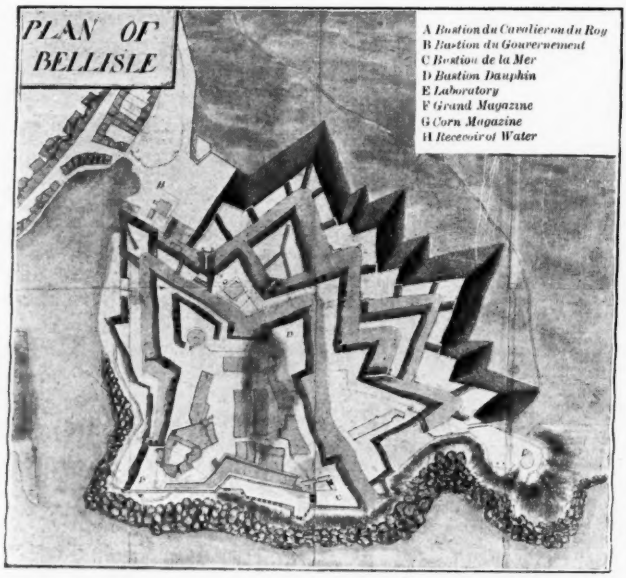
procured. He replied by sending me a long list of rules, and, as he has said here, I objected to some of the complications therein. Instead of taking this amiss, he took some of my suggestions, and although there may still be complications, he has certainly simplified matters. I think that Mr. Jane has begun on the right tack. He has taken his game on board ships, and down to the ward-room, and has listened to the criticisms of the younger officers, and has watched to see the interest or otherwise which is evoked by playing his game. I have noticed, too, that he has been ready to change any rules which seem either to suggest unreality or to spoil the game as a good game, and I consider he has been wise in steering clear of many fads which people have wished him to adopt. I agree with Captain Lowry, so far as I have seen the game, that Mr. Jane does not seem to have mastered the great and probably insurmountable difficulty of having a good ramming game, or even a good torpedo game. But if a game of that kind is possible it can only be by great practice with a simpler form of game. A game which consists, as this does, of evolutions and gunnery practice, is one which is very interesting and of great help to anyone who wishes to study how to do his duty in these difficult days, with all these new ships and inventions coming on. Some of the remarks at the end of the paper, made after playing many games, are interesting. If the game really can help us to decide whether one big battle-ship is more than a match for two small ones, then it certainly will be very useful. Again, there is a great deal that we want to know and study about formation. Is line abreast really better than line ahead? I should doubt it, but if we played 50 games, and in 30 or 40 line abreast came off best, that would help us to decide at any rate. Finally, it seems to me that one great point is that you can simplify this game very considerably if you like. We have all these cards and things with various penetrations, but they are not absolutely necessary. Once given Mr. Jane's materials, you can if you like give a ship so many points and score off so many for each hit; or, as an officer who was playing here this morning suggested, instead of using the target in the very ingenious way Mr. Jane has suggested, you can use dice. I entirely agree with Captain Lowry that if we get this game and work on it, it will help us to solve these very difficult problems which confront us in the present day, with new ships and untried formations.

Mr. F. T. JANE, in reply, said:—With regard to the point made by Captain Lowry as to the strategical game, my strategical game is somewhat of a fraud; it is not intended to *solve* strategical problems. I believe there are two or three very good strategical games in existence.[1] The idea is this. Suppose you give half of a certain number of ships to half the mess and half to the other, you work the thing out strategically to get an increased interest. It is all very well to put down six ships at one end of the table and six at the other, but in actual war you might not get them in that way; they might come abreast. And in the strategical game you get all that. That was the principal reason strategy was introduced. As to ramming tactics and torpedo tactics, I did not think it was wise to try to get too much; it was the complications I was afraid of, and nearly everybody seemed to think I had better not try too much. I had something of that sort at one time, but in trying for everything you get nothing.

The CHAIRMAN (Sir W. Kennedy):—We hope that some gentlemen will let us see a war game played; that is what we are all looking forward to. It is most interesting to hear Mr. Jane's remarks, but I do not think myself that you could gather very much without actually seeing the game played on the table. I saw an action

[1] The Russians have a strategical game invented by the Grand Duke Alexander, which works very well. The Japanese have another. It may be mentioned that my strategical game was once far more elaborate than it now is; these elaborations were deleted, as there seemed no call for them. I should add that the game reported in the *Engineer* did not include a fairly comprehensive system of scouting that my rules make provision for.—F. T. J.

between two ships this morning, and it was very interesting, but I am sure it would be still more so if we could get sufficient gentlemen to tackle the subject and oppose one fleet to another. Some one compared this to a game of billiards as a pastime; I should regard it as more in the style of a game of chess. There is a great similarity between chess and an action, whether ashore or afloat. The idea in chess is to concentrate the greatest force upon the weakest point of the enemy, and that, I take it, is what any general or admiral who knew his business would probably do, and most likely succeed. Those were the tactics of Nelson in the old days, and no doubt they would apply a good deal to the present. But of course the whole system of warfare is so entirely changed, that the idea of attack as exemplified at Trafalgar and other battles would probably not apply at the present time. I expect if an admiral took his fleet into action in line ahead, it would probably end in the foremost ships being sunk before the others got up. It was proved so in the old days; although adopted successfully by Nelson and Collingwood, their ships were fearfully crippled before the rest of the fleet came to their assistance. Therefore I think that the idea of Mr. Jane, of line abreast, would probably be the best formation to adopt in attacking the enemy. As to signals, I do not think that they would really be of much account in an action nowadays. I suspect when everybody knew his business, after the first attack, what with smoke and a certain amount of confusion, no signals would be made or paid much attention to. Every man would fight his ship to the best of his ability and go for the enemy, no matter who it was. With regard to the question of ramming, I do not believe in one ship ramming another unless the one was disabled, because if a man saw another ship coming down to ram him, if his ship was under command he could always avoid her. A slight touch of the helm, especially with these twin-screws, where they slue round so quickly, would alter the force of the ram, and unless a ram is fair upon the broadside it has no effect at all. Diagonally, it would perhaps have no result. With regard to one big ship being better than two small ones, this is the first I have heard of it. I cannot say at all whether that would be the case; in fact, I think I should prefer to have two moderately small ships to one big one. That remains to be proved. Also, with regard to the question of its being easier to defeat four ships with six than with nine or ten, I do not quite understand that; I do not know why that should be so. I do not see why there should be any confusion, because the admiral would tell off a certain number of ships to attack the four. After all, we know very little of what would occur. We have yet to see what would occur in a fight between two fleets at sea. We have not learned much at present from the Spanish and American fleets. I have been watching anxiously every day to see a real good fight between these two, but they have not arrived at it yet, and what is more, they do not seem likely to do so. The only chance would have been if Admiral Cervera, who probably knows his business, had sent a polite message to the American Admiral, asking him to kindly dismiss a certain number of his ships till he had the same outside as Cervera had inside, and then have a fair fight. I think if I had been in Cervera's place I should have done that. Then we should have seen something. But neither side seem inclined to do that; Cervera won't come out, and I doubt if Sampson would break his fleet up. After all, it is a thing which has been done before. In the celebrated fight of the "Shannon" and the "Chesapeake" you will remember Captain Brooke sent away his consort, and then sent a challenge in to Boston Harbour to Captain Lawrence of the "Chesapeake" to come out and fight him. He did come out, with the result that we all know.


PLAN OF BELLISLE
A Bastion du Cavalier ou du Roy
B Bastion du Gouvernement
C Bastion de la Mer
D Bastion Dauphin
E Laboratory
F Grand Magazine
G Corn Magazine
H Receoir of Water

THE SIEGE AND CAPTURE OF BELLE-ISLE, 1761.

THE following account of this little-known expedition is extracted from a carefully kept diary of Lieutenant Bernard Holbrooke, of the old 97th Regiment, which was raised in 1759 and disbanded in 1763.

Belle-Isle lies off the coast of Britanny, abreast of Quiberon Bay, and from its size and position forms a suitable point from which to threaten the mainland. The war with France, known as the "Seven Years' War," had already lasted five years, and was evidently drawing to a close, so Pitt determined on the seizure of the island, in order that he might have another valuable asset in his hand for exchange, when the peace negotiations came to be entered upon.

The land forces were under the chief command of Major-General Studholme Hodgson; a landing was effected on the 22nd April, and the island surrendered on the 7th June. Belle-Isle remained in the hands of the British until the Peace of 1763.

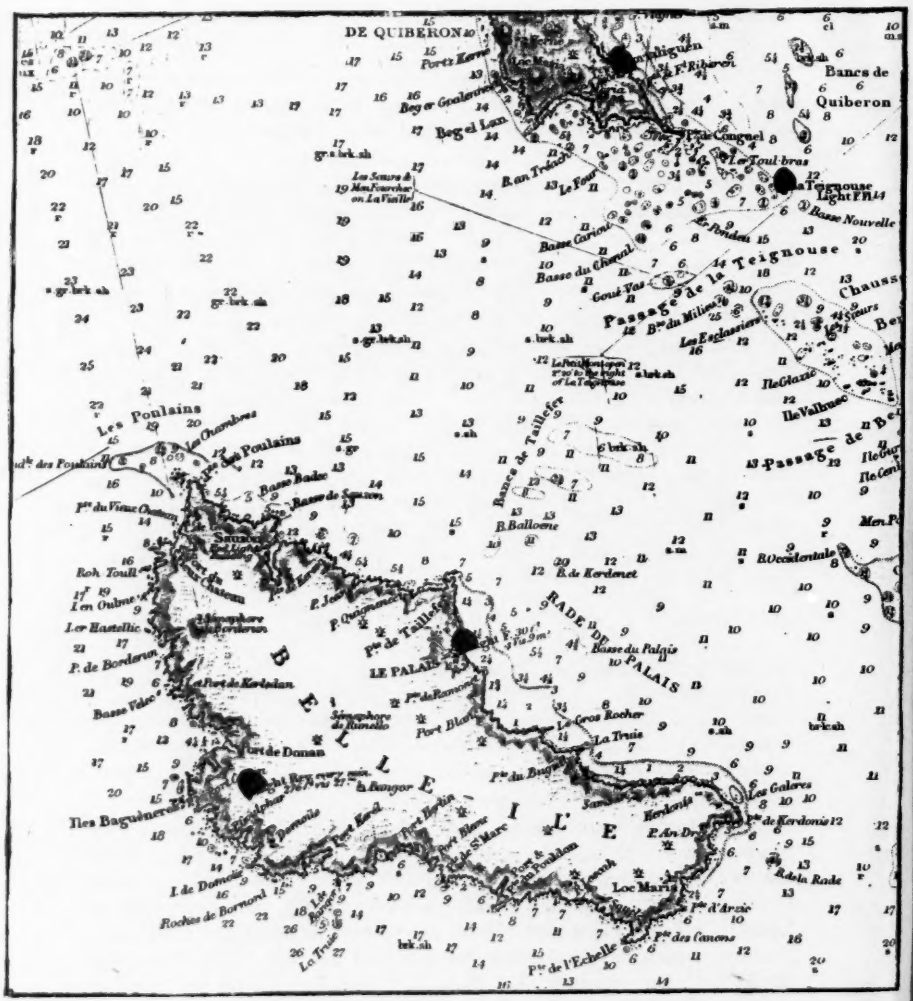
As far as possible the spelling of the names of officers and the titles of the various regiments have been corrected, and the numbers of the regiments have been added in brackets for better identification. It is a matter of regret that no map of the island is attached to the diary, so that it is impossible to show the position of the different villages, etc., round the town, which are mentioned by the writer.—R. H.

PART I.

The fleet, intended for the expedition, was commanded by Commodore, afterwards Viscount, Keppel, and consisted of 11 ships of the line, 8 frigates, 3 bomb-ketches, and 2 fire-ships, with 64 transports with troops, 4 store and baggage ships, 4 hospital-ships, 5 ordnance-ships, 3 bomb-tenders, and 15 victuallers—in all, 95 sail of transports, and 50 flat-bottom boats carrying above 60 men each.

The troops were placed under the command of Major-General Studholme Hodgson, and consisted of the following regiments:—Whitmore's (9th), Beauclerk's (19th), Royal North British Fusiliers (21st), Loudoun's (30th), Erskine's (67th),[1] Colvill's (69th), five companies of Craufurd's Royal Volunteers (85th), and 2 battalions formed from independent companies under the command of Lieut.-Colonels Grey and Stuart, with one company of artillery and 7 detachments for the battalion guns, making in the whole 170 men of the artillery. In addition, there joined from Ireland 2 battalions of Rufane's (76th), Morgan's Light Infantry (90th), and a battalion of Marines of 500 men, under the command of

[1] The 67th, which had previously been Erskine's, at this period was known as Lambert's Regiment. Erskine's was the 25th, then in Germany.—R. H.


DE QUIBERON
Bancs de Quiberon
Passage de la Teignouse
Les Poulains
Les Poulains
Basse Badie
Basse de Taillefer
Basse du Palais
RADE DU PALAIS
LE PALAIS
B. Balloene
B. Occidentale
B. de Kerdonet
Ile Glazic
Ile Valhuec
Ile Cerf
Ile Houat
Ile Hoedic
Ile Dumet
Ile Rouzic
Ile Rouzic
Ile Rouzic

Lieut.-Colonel John Mackensie. The effective number of which in the whole amounted to 8,339 men.[1]

The general officers on this service were Colonels John Craufurd and William Rufane; the major-generals were Lieut.-Colonels Hamilton Lambert, Guy Carleton, and the Hon. William Howe; and brigadiers, Lieut.-Colonel Sir Thomas Spencer Wilson, Bart., D.A.G., and Lieut.-Colonel Lewis Thomas, Q.M.G.; Captain Abraham Tovey, C.R.A.,[2] and Major James Bramham, Chief Engineer. The chief articles of the proportion of ordnance sent out for the expedition were :—

Brass Cannon	24-pounders, heavy	8
	12 mediums	6
	6 light	14
Brass Howitzers	8-inch	4
	4½ ,,	2
Brass Mortars	10-inch	2
	8 ,,	4
Pontoons		5
Powder	Barrels	416
Round Shot for	24-pounders	2,400
	12 ,,	1,800
Shells	10-inch	400
	8 ,,	1,600
	4⅖ ,,	400
Wagons		17

Besides round and case shot cartridges, intrenching tools, etc. But there were no artillery horses sent out with this first proportion.

7th April.[3]—This morning the fleet passed the south end of Belle-Isle, close along the shore, and at one of the bays by Point Locmaria, Major-General Hodgson and Commodore Keppel thought a descent might be tried, but as the wind was then southerly it could not be attempted at that time. At noon the whole fleet anchored in the great road, when the general and the commodore reconnoitred the northern parts of the island, during which time the ships-of-war were preparing the flat boats for the reception of the troops. At their return they fixed upon Port de Andro as the proposed place to make the descent, but it was too late in the day to make any trial. Orders were given out this evening for the reserve to be in the flat-bottom boats at 4 o'clock the next morning. It was composed of the seven companies of grenadiers, of Whitmore's, Beauclerk's, Scotch Fusiliers, Erskine's, 1st Battalion of Rufane's, Colvill's, and Loudoun's, under the command of Majors MacLean[4] and Purcell,[5] and the four battalions of Beauclerk's, Craufurd's,

[1] The 97th raised in 1759-60 and disbanded in 1763, and the 98th raised in 1760 and disbanded in 1763, were also employed in the siege.—R. H.

[2] Brigadier-General T. Desaguliers was subsequently employed with the artillery.—R. H.

[3] The expedition started on the 29th March.—R. H.

[4] Major Francis MacLean, 97th.

[5] Major Purcell, 98th.

Morgan's, and Erskine's. Brigadier Carleton was with this corps, and the whole under the command of Major-General Craufurd. The flat-bottom boats were under the direction of Commodore Barlow of the "Téméraire."

8th April.—This morning the transports got on their way and sailed to Port de Andro at the south-east part of the island, the men-of-war remaining off the citadel of Belle-Isle. The reserve under the command of Major-General Craufurd, having embarked in the boats at 4 this morning, rendezvoused at 12 under the stern of the "Achilles," which with the "Hampton Court," "Furnace," and "Firedrake" bombs began to cannonade and bombard the fort. In about an hour the fort seemed silenced, upon which the boats rowed directly to shore and landed about 300 men on the rocks and beach, who formed up as soon as they got up the heights. The enemy, who were prepared for their reception, charged them directly with fixed bayonets, and as they were much superior the small number that landed were very soon made prisoners and conducted up the country; upon this, the boats that had not yet disembarked the remainder of the reserve returned to their ships. One of the flat boats landed 60 of Erskine's grenadiers, who got up a very difficult place to the top of the hill, where they formed, but were immediately routed by a more numerous body of the enemy. All attempts to succour them were ineffectual any farther than that the boats brought about 20 of them from the rocks. During this time Sir Thomas Stanhope, with four ships-of-war, with the battalions of Grey's[1] and Stuart's[2] and 500 Marines in transports, made a faint attempt to land opposite Sauzon, at the northern part of the island; several men were killed in the boats, which not being able to make their respective ships, the troops were for the present put on board the first transports they could reach. Major-General John Craufurd and Brigadier-General Carleton exerted themselves as much as possible on this occasion. Our number of killed, wounded, missing, and prisoners in this attack were as follows:—

Whitmore's	Lieut.-Colonel Lewis Thomas, Q.-M.-General, wounded.
	Lieutenants S. Surman and W. Ryder, and 52 rank and file prisoners.
Beauclerk's	Lieutenant Douglas Stewart, 1 drummer, and 20 rank and file killed.
	Major C. Lumsden, 1 sergeant, 1 drummer, and 38 rank and file wounded.
	Lieut.-Captain J. Scrymour, Lieutenants A. Forbes and J. Nugent, 4 sergeants, and 115 rank and file prisoners.
Fusiliers	1 sergeant and 2 rank and file killed, 1 sergeant and 9 rank and file wounded.
	Lieutenants P. Innes and J. Ramage, 1 sergeant, 1 drummer, and 39 rank and file prisoners.

[1] 98th Regt.—R. H.
[2] 97th Regt.—R. H.

Erskine's[1] - - Captain Osborne and Lieutenant Gardiner, 1 sergeant, and 6 rank and file killed; 16 rank and file wounded.
Capt.-Lieutenant M. Green and Lieutenant W. Herdsman, 1 sergeant, and 32 rank and file prisoners.

Colvill's - - 1 drummer, 1 rank and file killed, 3 rank and file wounded.
Lieutenants J. M. Travers and W. Jackson, 1 sergeant, and 32 rank and file prisoners.

Rufane's one bttn. - 4 rank and file wounded.
Lieutenants T. Sheldon and W. Dewxell, 1 sergeant, 1 drummer, and 23 rank and file prisoners.

Stuart's - - - Major F. MacLean, wounded.

Grey's - - - Major Purcell, killed.

Amounting in the whole to:—

Lt.-Cols.	Majors.	Capts.	Lieuts.	Sergts.	Drumrs.	Rank & File.
0	1	1	2	2	2	29
1	2	0	0	2	1	70
0	0	0	13	8	2	292
1	3	1	15	12	5	391

Total 37 killed.
76 wounded.
315 prisoners.
428

The loss of the fleet upon this occasion was as follows:—

"Valiant" - 1 midshipman, 8 seamen, killed.
Lieuentant Gregory, 2 midshipmen, and 20 seamen wounded.
1 midshipman, 18 seamen missing.

"Vesuvius" - 5 seamen killed.
7 seamen wounded.

"Atna" - - Lieutenant Jarritt killed.

12th April.—This day Lieut.-Colonel Thomas Desaguliers arrived from England with the rank of brigadier-general, and took command of the artillery. He came to Portsmouth the 6th of April, in the middle of the night, and immediately ordered the company of artillery there to be ready to embark at a moment's warning, went that same afternoon on board the "Blast," and sailed by daybreak the next morning.

13th April.—The battalion guns and light howitzers were ordered by Brigadier-General Desaguliers to be in readiness to land on the shortest notice, and to be put with their stores on board the ordnance

[1] Lambert's (67th).—R. H.

ships' boats the instant the signal was made for preparing to land the troops, but not to put off till they had further orders.

14th April.—Lieut.-Colonel Desaguliers was appointed in general orders to command the artillery on the expedition, with the rank of brigadier. Major-General Craufurd, Brigadier-Generals Desaguliers and Howe, with Commodore Barton and Captain Wallace, R.N., went round the island in the "Prince of Orange" to reconnoitre the south-west part of it, but found that side so very rocky and with so great a surf, that the officers of the navy declared the ships could not lie safely there.

18th April.—The commanding officers of Whitemore's, Loudoun's, Erskine's, and Panmure's[1] were ordered to form their battalion companies into 60 rank and file, 3 officers, 3 sergeants, and 1 drummer, and to be ready to embark in the flat-bottom boats on the first notice. The remaining companies of Panmure's were ordered to be in readiness to get into the sailing cutters that were to call for them on board their ships. The light artillery was ordered to be put into the boats whenever the signal was given for the troops to disembark, that it might be landed as soon as the troops. Lieutenant Steklin,[2] of the artillery, was appointed to act as brigade major to that corps.

22nd April.—In the beginning of the month of April it was known in England that the expedition had arrived off Belle-Isle, upon which Lieut.-Colonel Desaguliers, before mentioned, was appointed brigadier-general, and sent express to the fleets. A company of miners was ordered to march immediately to Portsmouth, and, when arrived there, they directly embarked with a company of artillery, which was quartered at the same place, on board the artillery store-ships, and sailed from Spithead the 13th. This fleet consisted of about 20 sail of transports under convoy of the "Buckingham" and "Nassau" and a sloop-of-war, having on board one company of artillery, one of miners, three troops of Burgoyne's,[3] consisting of 200 light dragoons and 54 artillery horses. Three ships were laden with ordnance stores, and about ten with fascines and gabions. The chief articles of this further proportion of stores that were now sent out were :—

Brass Ordnance	24-pounders, heavy	4
	12-pounders, medium	2
	6-pounders, light	2
	3-pounders, light	4
Brass Howitzers	8-inch	5
Brass Mortars	13-inch	2
	10-inch	2
	5½-inch	10
	4⅘-inch	20
Powder	Barrels	300
Round Shot	24-pounders	1,200
	12-pounders	600

[1] Earl of Panmure's 21st Fusiliers.—R. H.

[2] ? Captain Stehelin.

[3] Now the 16th Lancers.—R. H.

Shells -	13-inch - - - -	200
	10-inch - - - -	200
	8-inch - - - -	1,400
	$5\frac{1}{2}$-inch - - - -	3,000
	$4\frac{2}{5}$-inch - - - -	6,000
Wagons - - - - - - - - -		6

besides round and case shot cartridges, intrenching tools, etc.

This fleet made the island of Belle-Isle on the 22nd, in the morning, and were ordered to come to an anchor about three leagues from the grand fleet, where it was joined by some men-of-war from that fleet; and the troops last arrived immediately received orders to assemble in the ships' boats under the stern, in order to make the greatest appearance possible of an intention to land. This was accordingly done, and they directed their course towards the Point of Sauzon, in order to draw the attention of the enemy that way, and give the army an opportunity of effecting their landing near Port de Andro, not far from the place where the troops were repulsed the 8th inst. This afternoon the troops landed[1] near Port de Andro, under the command of Major-General Craufurd, and supported by a very warm fire from the ships which were appointed to cover them. Some small parties got up very steep rocks where the enemy did not expect them. These formed upon the heights and flanked the troops that advanced to attack those which landed in other places. After a very smart fire on both sides, the enemy, being broken, made a very precipitate retreat. We took this day three field pieces of brass cannon. The enemy had about 60 men killed, amongst whom were some officers, and several wounded. Our loss was about 30 killed and some wounded, amongst whom were 2 or 3 officers. Lord Pulteney[2] was among the first that got up the heights, and, being seconded by Major Skinner,[3] formed some of the troops there. The feint made by the reinforcement that came that same day from England contributed greatly to the success of this landing, for M. St. Croix,[4] governor of the island, sent several messages to the officer who commanded at Sauzon to send him a part of his troops, but he always returned for answer that the English were landing there, for which reason none could be spared. The army got all on shore this night, and took possession of several posts abandoned by the enemy. The Marines that landed from the different ships in the fleet at this time and soon afterwards amounted to 900 men, which, with the battalion mentioned before, made the whole corps of Marines on shore to consist of 1,400 men. They were under the

[1] It has been generally supposed that the landing was effected by a detachment of Marines and the 19th Regiment, under Brigadier-General Hamilton Lambert, near Point Locmaria. The grenadier company of the 19th, under Captain James Paterson, gained the summit of the rocks before the enemy saw what was intended, who immediately marched a body of 300 men to attack them. The 19th Grenadiers, though they lost heavily, maintained their ground till the remainder of Brigadier Lambert's troops got up. Captain Paterson lost his arm on the occasion.—R. H.

[2] Lieut.-Colonel W., Viscount Pulteney, 85th Foot (Craufurd's).

[3] Major Wm. Skinner, 85th Foot.

[4] The Chevalier de St. Croix.

command of Captain Collins,[1] who was, upon Colonel Mackensie's being wounded, appointed major.

23rd April.—This morning the army marched towards the citadel or castle of Palais, which formerly belonged to the Marquis of Belle-Isle, but which has been converted into a strong fortress, and encamped with the village of Mewzel upon the right, that of Partavan in the rear, and the citadel of Palais in front at the distance of about 2,200 yards. The enemy were observed this day raising a work upon our left and two redoubts upon the right. The ships that came last from England began this morning to disembark part of the two companies of artillery and light horse, with some field pieces, but it blew so fresh in the afternoon that no boats could get on shore. The army remained quiet all this night, but without either tents or provisions.

24th April.—It continued to blow very hard. Some tents and very few provisions were got on shore. More of Burgoyne's Light Horse were landed this night. Many boats that put off from the ships were lost and the provisions much damaged.

25th April.—It continued to blow hard and nothing could be landed[2] this day, which was greatly in the enemy's favour, as it gave them time to raise redoubts and works on all the advantageous ground within cannon-shot of the town. The want of a sufficient number of tools prevented our advancing, as we could not raise works to cover the troops. There was great scarcity of provisions all this day in camp. This morning Major-General Hodgson and Brigadier-General Desaguliers reconnoitred the bays to the right of the camp, in order to pitch upon a proper place where the heavy artillery and stores might be landed. In the afternoon six light field pieces and two royal howitzers were sent to the village of Casperne in front of the camp, 1,670 yards from the citadel and 1,250 from the enemy's redoubts Nos. 2 and 3 (and in the rear of where the sea mortar battery afterwards was), which posts were this day intrenched in order to secure the advanced posts, but only two of these guns were left at night. The piquets that mounted this night consisted of 1 field officer, 5 captains, 15 subalterns, and 500 men. A guard of 1 subaltern and 40 men took post at the Grand Sable. This night the piquets advanced from the intrenched village on the left to the village Bordelius, about 800 yards in the front (afterwards called the Burnt Village), which they took possession of, and made 1 corporal and 5 men of the enemy prisoners. There was a working party with this command to intrench the village, which happened to be naturally strong.

26th April.—This morning, between 6 and 7, the enemy fired very smartly upon the village with four pieces of cannon, and the commanding officer, seeing about 200 of the enemy in intrenchments upon his flank, retired with his party after having had possession of the post 12 hours. He had 1 man killed, and 1 wounded. This post, as appeared afterwards, was of some importance. Our troops upon quitting it set the village on fire. The weather continuing bad, the heavy artillery

[1] Brev. Major A. T. Collins.

[2] This probably means the artillery and siege *matériel*.—R. H.

could not be landed, so that little more than provision and camp equipage for the army were got on shore this day; and as Burgoyne's Horse were not yet all disembarked, we could not get the artillery horses on shore. The regiments fixed their hospitals in the different villages in the rear of the camp. It having been reported to General Hodgson that the inhabitants passed without interruption from the town of Palais and through the camp to different parts of the island, the officers in the outposts had strict orders to keep them all in the town. A party of Burgoyne's Light Horse took post this morning at Sauzon. The officers who understood the branch of engineering were ordered to give in their names to the adjutant-general. This day we discovered a very fine watering-place or reservoir, arched over, about 72 feet in length, 18 in breadth, and 24 deep; it had four pipes to the bay, and let out the water through four brass cocks. It appears to have been intended as a watering-place for ships, but the inhabitants say that in very dry summers there is great scarcity of water, so that they are obliged to have recourse to reservoirs, of which there are several more in the island. This morning a detachment of 40 men attacked a post which lay upon the right of the army, towards the sea; after some firing on both sides the enemy retreated. We had one of the grenadiers much wounded. Major-General Hodgson and several of the general officers were present at this attack. To-day we intrenched the village of Butelot upon the right and opened our embrasure on the breastwork that evening, at which time we carried down there two light field pieces and two Ligonier howitzers. The enemy fired several shot and threw shells at us, but they did no execution. As soon as the work was ready we returned it, and began our first fire from the howitzers and field pieces in this new work; during the night we fired shot and shells at the new works the enemy were constructing. We likewise took post this night in the front and to the right of the village, and began to break ground in order to erect a redoubt. This night Sir William Pur Williams[1] fell in with the enemy's posts, and was unfortunately killed.

27th April.—We continued all this day to work upon the redoubt, notwithstanding the continual fire of all the guns and mortars in the citadel that bore upon it, and which did little or no execution. We likewise fired from the intrenched village of Butelot, on the works that they were carrying on. The weather was more moderate. As we got several things landed, particularly the wagons and intrenching tools, an application was this day made to Commodore Keppel for seamen and boats to land the heavy artillery and stores. This evening the bomb-ketches began to bombard the citadel; during the night we were quiet on both sides, and continued to work.

28th April.—We continued this day strengthening our posts in the front, and finished our redoubt on the right. The enemy made a straggling attack upon it, but soon retreated. The general desired that the commodore would order shells and carcasses to be thrown from the bomb-

[1] Captain Sir W. P. Williams, Bart., Burgoyne's or 16th Light Dragoons.

ketches into the citadel, but Brigadier-General Desaguliers was of opinion that it would be better for them not to act till the batteries at land were ready to open.

29th April.—The enemy continued to fire shot and shells at all our advanced posts, and disabled one of our light field pieces in the intrenched village of Casperne on our left. We continued all this day to throw up works in order to strengthen our advanced posts. This day Brigadier-General Desaguliers applied to the commodore for assistance from the navy to land the heavy artillery, which was immediately granted, and the weather proving very favourable, the disembarkation of it was begun this day. A great quantity of ordnance and stores was brought on shore, and got with great difficulty up to the part through very steep and almost impassable roads, in which we received great assistance from the navy. The artillery horses were likewise landed this day. The bomb-ketches received orders from the commodore to throw shells into the citadel. 1 captain, 2 subalterns, and 50 men were ordered to march every evening from the piquets to join the captain's guard at Port Yoch, where the artillery stores were landed, and it was recommended to them to be extremely alert during the night. This reinforcement returned always in the morning to camp.

30th April.—The weather continued good, and we landed a great many stores and heavy artillery; two medium 12-pounders were sent as soon as it was dark to the redoubt upon the right; two 12-pounders and one 8-inch howitzer were sent at the same time to the intrenched village of Casperne. Our firing upon the enemy now at the distance of about 1,000 yards, and before we have proper batteries erected, seem to be but of little service, and rather draw their fire on our working parties. Two companies of Marines came on shore. The detachment from on board the bomb-ketches joined the artillery, consisting of 1 captain, 3 subalterns, 6 N.C. officers, and 24 rank and file.

1st May.—We opened two embrasures in the redoubt on the right and made a road of communication on the left to our most advanced posts. This day four field pieces and intrenching tools for 400 men were ordered to be at the head of Rufane's second battalion at 4 o'clock in the afternoon, at which place 1 field officer, 4 captains, 12 subalterns and 400 men paraded at the mounting of the piquets in the evening. The field officer was Major Veitch,[1] and 2 captains, 8 subalterns and 400 men as a working party, paraded at the same place and time, under the orders of Brigadier-General Hamilton Lambert, who marched with them this night, to the left, and took on an advantageous spot of ground in front of the village of Kergayet (in the rear of where the left redoubt was afterwards), which had been reconnoitred the day before. They met with little opposition from the enemy, and took 1 sergeant and 9 men prisoners. As soon as ever we had permission of the ground the working party immediately began to throw up a breastwork at the distance of 1,930 yards from the citadel. Several deserters came in this day to our posts on the left, among whom two of the Regiment of Nice reported

[1] Major C. Veitch, 67th Foot.

that the enemy had 24 brass guns in the citadel, 6 brass mortars, and 2 iron and only 5 guns that bore upon the shipping, that they expected a reinforcement from Nance, and were to hoist a red and white flag at the citadel whenever there was an opposition for them to push over. An advice boat got into Palais, and several chase-marées were taken off Sauzon. All our guards and piquets were ordered to be under arms half-an-hour before daylight and to remain so till the patrols returned and acquainted them that all was well.

2nd May.—At break of day this morning the enemy began to cannonade the post taken last night and the working party was ordered off. Brigadier-General Lambert ordered two of the field pieces to advance to a village on his left in order to turn the enemy, who had a post there. A party of light horse was sent to escort the guns, but after some firing from the enemy they retreated. The cannon, however, advanced about 700 yards to the left, and being pretty near the village began to cannonade it, and soon dislodged the enemy. During this time a party of about 300 men advanced with an intention to get between the field pieces and the brigadier's post, upon which the officer commanding them was obliged to draw back his guns as quick as possible to an eminence in the rear, from whence he fired upon that party. This obliged them to file off to the right, but still advancing till they came very near the brigadier's post, and then they immediately retired under cover of the heights without any firing on either side. Major-General Hodgson came early in the morning to visit this post, and finding it a very advantageous one immediately ordered a new working party, which continued to construct the redoubt and finished the gorge. We got up an 8-inch howitzer and fired several shells at the redoubt the enemy were constructing in our front (which was afterwards called the Tusdales) redoubt on the right of the artillery batteries. In the afternoon we began to make embrasures in our new redoubt, and two 12-pounders were sent there as soon as it was dark. Our troops advanced this night to take possession of the Burnt Village, which we took on the 25th and quitted again the 26th, for this was the place fixed upon for the opening of the trenches. It was centrical to our posts, and therefore a proper situation for lines of communication with them all. There was a party of the enemy in this village of about 40 men, who, after some firing with small arms, retired to their redoubts, upon which we immediately took possession of the post and opened the trenches at about 900 yards from the citadel. Our working party, covered by a constant fire from the left redoubt and other advanced posts which kept the enemy in check, carried on the trenches all this night with very little opposition. Brigadier-General Desaguliers applied to the general for 200 men to serve with the artillery, as we already began to find ourselves insufficient for the several duties we now had. But these men could not at present be obtained. 1 field officer, 3 captains, 9 subalterns and 300 men were sent to the new redoubt on the left, thrown up last night. The men that paraded to go for provisions were ordered to bring with them all the carriages and horses they could find in the front or rear of their regiments.

3rd May.—The enemy sent this morning some small parties from their redoubts to disturb the workmen in the trenches, but the fire of shot and shells from all our advanced posts soon obliged them to retire under cover of their works and lines, and kept them pretty quiet the rest of the day. They cannonaded from the citadel the redoubt on the right, and are very hard at work near the windmills. At noon a fascine-ship was blown up near the great road. At night a very large body of the enemy with some field pieces attacked the trenches, and the troops that were drawn up there in that part where the attack began, giving way, they got into them. Major-General John Craufurd, who had made his disposition on the left, and was then going along the front towards the right, fell in with the enemy in the dark, and was, with his two aides-de-camp, taken prisoner. The two field pieces that were posted on the left of the trenches and unsupported by the troops, being well served with grape-shot, obliged a party of the enemy of 300 men, commanded by a field officer, to retreat. He had with him an artillery officer with spikes to spike up the guns. At the same time Colonel Robinson, with some platoons, rallied those that fled, and charging the enemy on the right with great spirit, drove them entirely out of the trenches.[1] Some officers and men were killed and wounded on both sides, and several prisoners taken. The guard of the trenches this night consisted of 2 field officers, 6 captains, 18 subalterns, 24 sergeants, and 600 men. 1 captain, 3 subalterns, and 100 men were sent this evening to the village of Casperne, where they joined 100 Marines.

4th May.—The weather was extremely good, and we continued bringing up artillery and stores, which were daily sent to the different posts as fast as they could be got up. There was very little firing this day with small arms, but the enemy kept a constant cannonade, and threw shells from the citadel on all our advanced posts and trenches, which we were carrying on with all possible expedition. We began to make a mortar battery in the ravine to the left of the trenches at the distance of about 1,000 yards from the citadel. About noon the enemy opened two guns upon the trenches. The commander-in-chief ordered 180 men from the line to encamp and do duty with the artillery. The constant fire that the enemy have made upon our right redoubt has much damaged that work. The piquet for that redoubt was ordered not to march off till after dusk in the evening. Lieut.-Colonel Robert Douglas, of the 19th, and Lieut.-Colonel John Jennings, of the 30th Regiments, were appointed to act as brigadiers. Stuart's and Grey's Regiments were ordered to encamp in the line, and to leave 1 captain, 2 subalterns, and 60 men at Sauzon. 2 subalterns and 200 men were ordered to parade every morning at 5 o'clock in order to fetch provisions from the landing-place. The piquet that mounted in the trenches this night was augmented, and a much larger working party ordered. The inhabitants were forbidden to come into the artillery camp or near the magazine.

[1] The War Office Official Account, p. 17, puts a different complexion on the affair. It says the French did not follow up their successful attack on the left, and, satisfied with their success, retired of their own accord.—R. H.

5th May.—About 1 o'clock this morning, during the relief of the sentries, an alarm was given that the enemy were approaching to attack the trenches, which occasioned a very great fire from the troops that were mounted in them. Lieutenant Stone, of Panmure's Regiment, was, unfortunately, killed, as he was posting the sentries, by a musket shot from one of our own people.

The weather still good. We continued to carry on the trenches, and to work at our mortar battery on the left. The enemy continued to cannonade and throw shells, by which we had this day 16 men killed. They fired very smartly from the Bastion du Cavalier and outworks with five guns upon our left redoubt. We carried to-day several pieces of artillery and mortar into the trenches, and brought up a great quantity of ordnance and stores from the landing-place. At night the enemy made two feint attacks on the trenches. We fired to-day from the head of the trenches on the enemy's redoubt on our right. The fascines, piquets, and gabions were ordered to be brought up by the masters of transports and their crews. The navy began to land seven 12-pounder iron guns from the "Prince of Orange" man-of-war. The Corps of Marines were ordered to take the following posts, and to relieve them at 6 o'clock every morning from their own encampments, viz. :—

	Capts.	Lieuts.	Sgts.	Ptes.
At the landing-place for provisions	1	1	3	56
At the village on the right ..	1	3	4	100
Near the camp	0	1	2	40
At the village of Casperne ..	3	3	4	100
Besides which they were to mount a piquet of	1	2	3	50
	6	10	16	346

which was to be in readiness to turn out at the shortest notice. The troops were brigaded for doing the line duty in the following manner, viz. :—

	Regiments.	Men.
1st Brigade - -	Whitmore's (9th) - -	743
	Erskine's (67th) - -	766
	Rufane's, 2nd Bn. (76th) -	460
	Craufurd's (85th) - -	117
		—2,086
2nd Brigade - -	Beauclerk's (19th) - -	632
	Loudoun's (30th) - -	780
	Morgan's (90th) - -	496
	Craufurd's (85th) - -	176
		—2,084
3rd Brigade -	Panmure's (21st) - -	750
	Rufane's, 2nd Bn. (76th) -	576
	Colvill's (69th) - -	606
	Craufurd's (85th) - -	152
		—2,084
		6,254

The duty was ordered for the future to be done by brigades, and the brigade for the day was to take the following duties:—

	Capts.	Sblns.	Sgts.	Men.
Port de Andro - - - -	0	1	2	30
Village on the left of the camp -	2	6	6	150
Windmill on the left of Bangor -	0	1	2	30
Village of Bangor - - -	1	2	3	50
Magazine of provisions - -	0	1	2	25
Artillery guard - - - -	1	2	4	100
Guard on cattle - - -	0	1	2	30
Provost's guard - - -	0	0	1	18
With the engineers - - -	1	2	4	100

N.B.—These guards were relieved every 24 hours at 6 in the morning.

	F.O.'s.				
Redoubt on the right -	1	2	6	8	200
Burnt Village - - -	2	6	18	24	600
Redoubt on the left - -	1	3	9	12	300
	4	16	49	70	1,633

These three last detachments paraded at gun-firing in the morning, in order to reach their posts after dusk. The brigade for duty was likewise ordered to parade 150 working men, with officers in proportion, at any hour the chief engineer thought proper to direct; the other working parties were to be given by the two brigades off duty, but the officers for those men by the brigade of the day. The chief engineer was ordered to acquaint the major of brigade of the day of the number of working men wanted at least two hours before he would have them parade. Burgoyne's Regiment was ordered to augment their guard at the windmill to 1 subaltern and 25 men this evening. It was recommended to the officer to be extremely exact in keeping proper and constant patrols during the night. The guards, posted within cannon shot of the enemy, were ordered not to stand to their arms whenever any general officer passed, not even to the commander-in-chief, unless particularly ordered so to do. Craufurd's Regiment encamped in the line this evening. Captain Chambers, of the Marines, was appointed to act as major of brigade to that corps. Whenever the general officer of the day thought proper to make any alterations in or add to the outposts, he was directed to report it immediately to the commander-in-chief. The post in the left in the redoubt was reduced to 1 field officer, 2 captains, 6 subalterns, 6 sergeants, 200 men. The village on the left of the ravine on the left of the camp was reduced to 3 captains, 3 subalterns, 4 sergeants, 100 men. Grey's and Stuart's Regiments were ordered to take post at Port de Andro, and to relieve every four days. As the above posts were reduced, the brigade on duty was ordered to parade 350 workmen instead of 150. We had this night about three men killed, and the same number wounded in the trenches. The enemy fired with musketry at the piquets, which we did not return, but kept our fire. They threw several good

shells this day into the trenches. In the evening the chief engineer closed the right of the trenches with a redoubt which they began to work upon this night, A French artillery gunner taken prisoner reports that they have not above thirty regular gunners in the place, and but six mortars.

6th May.—We were pretty quiet this morning, but about noon we opened our mortar battery to the left of the trenches upon the enemy. It consisted of nineteen mortars, viz , two 13-inch, four 10, six 8, and 7 royals. It was intended for the citadel, but most of the shells fell this day into the town and near the redoubts, which put the enemy in great confusion. We fired pretty smartly upon their redoubts to our right from our left redoubt, which kept them in check, and prevented their firing at our parties in the right of the trenches. We continued throwing of shells from our mortar battery, and as a great many of them fell into that end of the town which was next the sea, the inhabitants and troops were obliged to take refuge in the other end of it. Our artillery then on the left redoubt, being directed thither, cleared that end of the town as far as the drawbridge. The enemy fired very briskly this day on all the works they could bring their guns to bear upon, and threw shells to the left and farthest part of our encampment. The shells thrown this evening from our mortar battery were mostly into the citadel. The different motions of the enemy this afternoon gave us some reason to expect that they intended to attack us in our trenches, for which reason the general officer for the day made a disposition to receive them, and Brigadier-General Desaguliers posted the artillery on such advantageous ground where it was likely to do most execution. The ravine to the left of the mortar battery having been visited and found liable to be insulted by the enemy, two light 6-pounders were placed at the head of it, and the piquet there reinforced. The sea mortars were ordered ashore from the bomb-ketches, but the beds were left on board as it was proposed to fix them in the ground. A bombardier of the artillery was wounded by a shot from the enemy in the redoubt on the left, against which their chief fire seemed to be levelled this day; this redoubt is much damaged, and wants repairing. One mattross was killed and another wounded at the head of the trenches by a shot from the enemy which dismounted one of the howitzers. Several of the enemy's shells fell this day very near the artillery camp. The fire made this day from the mortar battery and from a 12-pounder advanced in the front of it, did great execution on the enemy in their redoubt upon our right; at the same time a very smart fire from the guns and howitzers in the left redoubt dislodged the enemy from their redoubt on our left. The chief engineer was ordered to advance a work before the trenches for a battery opposite to the Bastions du Gouvourment and du Cavalier. A deserter came into the redoubt on the left; he belonged to the Regiment of Nice, and pretended that he waited upon one of our officers who was prisoner in the citadel and who advised him to come over to us, but he gave little or no intelligence. It was to-day ordered that all the prisoners of the enemy should be sent to the grand hospital at Bangor. The inhabitants were

not suffered to come into the camp, and if any were found there they were to be immediately sent without the advanced sentries of the outposts, who were to have the orders repeated to them not to suffer any person of the enemy to come within them. Craufurd's Regiment was appointed to do duty in the first brigade, instead of the second battalion of Rufane's, which battalion was to move from their present encampment and take the ground shown them by the Q.-M.-G. Rufane's second battalion was ordered to take the following duties, which they were to relieve from their regiment's parade:

	Sbltns.	Sergts.	Men.
Port de Andro to be relieved once in 48 hours and to take provision with them - - - - - -	1	2	24
At the windmill on the left of Bangor	1	2	30
Provost's guard - - - - -	0	1	18
At the village where the Provost quarters - - - - - -	1	2	40
	3	7	112

These three last posts were relieved every 24 hours.

The Corps of Marines were divided into three divisions; the first consisted of 340 men to do duty with the first brigade, and to take up the ground of Rufane's second battalion. The second division consisted of 362 men to do duty with the third brigade.

1st division of Marines - - - - - -	340
2nd ,, ,, - - - - - -	386
3rd ,, ,, - - - - - -	362
	1,088

The commanding officer of Marines to proportion the officers and sergeants to the three divisions, and when any more Marines arrived from the ships they were to be equally divided amongst the three divisions. The guard at Bangor was reduced to 1 subaltern, 2 sergeants, and 30 men, and the post at the village of Casperne was reduced to 1 subaltern, 2 sergeants, and 30 men.

7th May.—The weather continued good. The "Prince of Orange" with the three bomb-ketches stood into the citadel this morning and began to bombard it. But they had no artillery people, either officers or men aboard. The enemy threw several shells at these ships and kept up a very smart fire all this day from the citadel, which we as warmly returned from our different batteries of mortars, howitzers, and medium 12-pounders, and prevented their annoying us much in the right of the trenches. They have removed their guns from the sea side and placed them to the land. A gunner of the artillery was blown up in ramming home, some of the cartridges having hung fire in the piece. We carried some of the royal mortars to the head of the trenches to fire upon the enemy's redoubts, as they had much annoyed our working parties, but a constant fire from these mortars soon quieted them. Brigadier-General

Desaguliers with the chief engineer went round the trenches this evening in order to pitch upon the most proper places for erecting batteries. There was very little firing with small arms this night, but a constant cannonading and bombardment. It having been reported to the general that the English prisoners in the citadel were ill-treated by the enemy, being allowed only bread and water, and that they were so much exposed that several had been killed by our own shots or shells, Colonel Burgoyne was sent to the Continent to represent it to the Duc d'Aiguillon. The guard at the village where the Provost quarters had a captain and 67 men of Rufane's second battalion added to it, which battalion was also ordered to take the guard of 1 subaltern, 2 sergeants, and 30 men at Bangor. Several of the fascines and piquets having been burnt as firewood, the Provost had orders given him to hang the first man or woman that he found burning or making use of any such wood.

8th May.—This morning Lord Pulteney[1] advanced from the right redoubt and took possession of the village of Port Halan in the front and opposite the windmill. The enemy fired with small arms from the redoubt. Brigadier-General Desaguliers being asked by the commander-in-chief and other general officers his opinion of the different posts we then occupied, and the farther disposition of attack necessary to be made, he gave his sentiments on that head in a letter to the commander-in-chief. Some parties of the enemy advanced in the night and fired upon our chain of sentries that were posted in the front. But they soon retired, did no execution, and we remained quiet the remainder of the night. The post on the right was ordered for the future to consist of 1 captain, 3 subalterns, 4 sergeants, and 100 men. All the outposts done by the line, except that at the landing-place, and the redoubts in the right and left, were to parade at 5 in the evening, and march off immediately to relieve. It was ordered that none of the country people should come within the lines of encampment. The outguards were to give the sentries the strictest orders not to suffer any to pass them either to or from the enemy. The officers of artillery at the different guns and mortars were not to be ordered to fire till they thought themselves almost certain of doing real service. 2 field officers, 4 captains, 12 subalterns, 16 sergeants, and 400 men were ordered to parade this evening with the relief for the trenches, and to take post in the village of Port Halan, in the front of the redoubt on the right, which was taken possession of this morning by Lord Pulteney. The redoubt on the right was reduced to 1 captain, 2 subalterns, and 50 men. As we were not yet near enough to do much execution against the citadel, Brigadier-General Desaguliers desired the officers on the several batteries to be particularly careful of their ammunition, and not to fire but when they thought they could do real service upon the enemy. About 10 o'clock at night Colonel Tewdale sent for four 6-pounders to be taken down directly to the village on the right of the trenches, and opposite the windmill, which we took possession of yesterday. They were accordingly sent about 2 the next morning.

[1] Lieut.-colonel 85th Foot.

9th May.—This morning Major-General Rufane, who commanded in the trenches, saw a party of the enemy advancing slowly to our right flank, upon which he desired the officer of artillery commanding there to endeavour if possible to interrupt their approach. A medium 12-pounder was immediately brought up to the head of the trenches and under cover of some mantelets fired with grape-shot, which very soon drove them back. They retired about 350 yards in the front behind a little breast-work dug in the earth, which they had thrown up in the night-time, and which, lying under the brow of the hill and being very narrow, could not be seen by us, nor did our fire of small arms or cannon disturb them the least in this work. We kept to-day a constant fire from all our mortars and guns upon the citadel and outworks, under cover of which we carried on our works without much disturbance, extended our trenches, began a battery, advanced before the first parallel, and finished the redoubt behind it. We likewise intrenched the front of the village of Port Halan, last taken, which was opposite the windmills. An English officer who was sick was suffered to come out of the citadel upon his parole. The enemy's marksmen began to fire much to-day, which occasioned our sending the wall pieces to be mounted on the parapets at the village of Port Halan, last taken. It is reported that there are 7,000 men at Quiberon Point ready to push over the first opportunity in order to reinforce the enemy. Our shells to-day have done great execution in the citadel, particularly upon the cavalier of the Bastion du Roy; as have likewise our cohorns from the village opposite the windmill on the enemy's redoubt on our right. The post of the village of Bertelot in the front of the right is reduced to 1 subaltern, 2 sergeants, and 30 men. The post taken last in the village of Port Halan is reduced to 1 field officer, 3 captains, 9 subalterns, 12 sergeants, and 300 men. The relief for the outposts done by the line was ordered to parade at 4.30 in the evening. The relief for the trenches, the redoubts on the right and left, the village of Port Halan, and the working party was ordered to parade at 5.45. One adjutant and two sergeant-majors from the brigade on duty were ordered to go daily to the general of the day at 10 o'clock to receive his directions. Whenever the chief engineer demanded any number of men of Burgoyne's Regiment to carry fascines to the tail of the trenches, they were to be granted immediately. The commanding officers of regiments were directed to take care that the order of the 2nd inst., relative to their sending the tools to the park of artillery, was immediately obeyed.

This evening Brigadier-General Desaguliers sent 16 cohorn mortars to the new redoubt behind the trenches. We had some rain this evening, and remained very quiet all night. From our first landing till now the troops have kept very healthy.

10th May.—This day the enemy cannonaded and bombarded us very warmly from the citadel, and in the afternoon we fired very smartly upon their redoubts and works upon our right from the village of Port Halan, in which we had two royals, three cohorn mortars, two medium 12-pounders, and six light 6-pounders. Our grand mortar battery continued likewise to bombard the citadel. Our redoubt on the left has

received much damage from the enemy's fire. The parapet is much destroyed, the embrasure blown very wide, and the whole work wants repairing.

11th May.—This day our battery before the first parallel, which was begun the 9th, was much advanced, and in the evening we sent thither from the park six brass 24-pounders. The enemy fired ricochet on the village of Port Halan, but did no execution. They likewise fired very smartly with small arms, by which we lost several men, and an officer who acted as assistant engineer was killed by a cannon shot as he was placing a mantelet on the right of the trenches. They cannonaded the whole day from the citadel, but they threw very few shells till the evening, when they again bombarded the camp, and some of their shells fell in a line with our grand magazine and artillery park, and fell very near the latter. This day 30 Marines gave in a memorial to General Hodgson desiring leave to attack the most advanced redoubt of the enemy, and received for answer that it could not be permitted at that time, but he would give them another opportunity of showing their courage. We opened to-day a battery of two 13 and two 10-inch sea mortars, advanced before the village of Casperne and in the rear of the grand mortar battery. Colonel Burgoyne returned from the Continent. The Duc d'Aiguillon told him that we should find ourselves much deceived in the strength of the place as we came nearer to it, that the soil was all rock and not proper for trenches, and produced a plan of the citadel, which, as it appeared from thence extremely strong, Colonel Burgoyne told him he supposed that was as they had intended to fortify it. We kept a constant fire the whole day on their redoubts upon our right, and threw many shells into the citadel, which seemed to do much execution upon the cavalier of the Bastion du Roy. Grey's Regiment was ordered to send 1 subaltern, 2 sergeants, and 30 men with tents to take post at a bay (Port Kerel) behind the village of Bangor, and to relieve the party of 1 subaltern, 1 sergeant, and 24 men of the second battalion of Rufane's at Port de Andro. The post in the redoubt on the right was reduced to 1 subaltern and 30 men, and the field officers of Stuart's and the second battalion of Rufane's ordered to do duty in the lines. The provision party was ordered for the future to consist of 1 subaltern, 3 sergeants, and 100 rank and file; 1 captain, 8 subalterns, and 200 men with N.C. officer in proportion from the second battalion of Rufane's and Stuart's Regiments were ordered to parade at 5.45 this evening at the head of Beauclerk's Regiment, where an officer was to be ready to conduct them. The officers commanding working parties were desired to exert themselves to the utmost in keeping their men constantly employed. We were very quiet all this night.

12th May.—This day much cannonading and throwing of shells on both sides. We opened our new battery, advanced before the first parallel with four 24-pounders, from which we kept a constant fire the whole day on the enemy's second redoubt, No. 2, upon our right, with a design to make a breach in the work and knock down the palisadoes that

it might be the easier taken, whenever it should be judged proper to storm it. This battery was 430 yards distance from the enemy's redoubt No. 2, 920 from the envelope, and 1,050 from the Bastion du Gouvourment. We fired upon the same work with one 12-pounder, two 8-inch howitzers, seventeen cohorn, eight royal, and one 10-inch mortar. All these pieces did much execution on the redoubt, and the parapet was much destroyed. Brigadier-General Desaguliers having been informed by a deserter that the enemy relieved their guards at 8.30 in the evening, he thereupon gave orders for two volleys to be fired from all the mortars at that time, which was accordingly done this evening from 46 mortars and howitzers, which undoubtedly did great execution among them. Brigadier-General Desaguliers acquainted the general that we should very soon want intrenching tools, a great number having been lost at the first unsuccessful attempt to land, and many more worn out by digging in the rocky soil, and proposed sending a vessel to Plymouth in order to bring some with the utmost expedition. He at the same time acquainted the general that he thought it would be very necessary to send for more ammunition, as there was a probability of our soon being in want, and that two more companies of artillery would be likewise much wanted for the service of the battery. A deserter of the Regiment of Nice came in this morning, and reported that the enemy had lost a great many men, that twelve of the English prisoners in the citadel had been wounded by one of our shells and one killed. He pretended that we had attacked the place on the wrong side, for that it was weakest on our left towards the sea; that there were no mines between the farthest windmill on our left and the sea, and that none of the mines extended beyond the glacier; that towards the right of the town, between Bastion du Gouvourment and Bastion du Cavalier ou du Roy, there was a large gateway into the citadel, before which was a drawbridge, and that the ditch was about 15 feet deep. Being asked whether mines might not be made at the bottom of the wall, he answered Not, and said that the enemy expected the place would hold out a month longer. We fired to-day from the left face of our gun battery on the citadel, but with little effect, on account of the great distance, it being 1,060 yards from the Bastion du Gouvourment, and superior fire of the enemy. Two of the brass 24-pounders were rendered unfit for service on the gun battery after eleven times firing. We had a man wounded at the redoubt on our left at the time of relieving the piquet, and one of the artillery wounded at the village of Port Halan. The detachment of Burgoyne's Regiment posted in the rear of the redoubt on our right was taken off. 1 captain, 6 subalterns, and 200 men of Stuart's and the second battalion of Rufane's were ordered to parade for work at the head of Rufane's second battalion at 3 o'clock this evening, where Major Bramham was to send an engineer to conduct them. We formed a magazine of all the stores and ammunition for the several batteries in the trenches in the ravine near the grand mortar battery, to which place the officers of artillery at all the other batteries were ordered by Brigadier Desaguliers to send for whatever stores and ammunition they wanted.

The state of our batteries this morning was as follows :—

Ordnance.

Brass mortars.	9-inch mortars.	8-inch mortars.	8-inch howitzers.	Royals.	Cohorns.	24-pounders.	12-pounders.	6-pounders.	Remarks.
2	3	5	—	—	—	—	—	2	At the mortar battery in the trench
—	—	—	—	—	17	—	—	—	At the redoubt behind the trench on the right
—	—	—	3	—	—	—	2	2	At the head of the trenches
—	1	—	—	8	—	—	—	—	At the burnt village of Bordelius
—	—	—	—	2	3	—	2	6	At the village of Port Halan, opposite the windmill
—	—	—	2	—	—	—	2	2	At the redoubt on the left
—	—	—	—	—	—	6	—	—	At the gun battery in the front of the trenches
2	4	5	5	10	20	6	6	12	

13th May.[1]—From all these batteries we began at daybreak this morning to fire upon the enemy at all parts, but chiefly in their redoubts. This firing was continued without intermission for half-an-hour, when the signal was given from the village of Port Halan (where Colonel Phillips commanded) for making the attack, upon which parties advanced from the right of the trenches, but, falling in between the fire of the enemy's two redoubts on that side, were obliged, through a superior fire, to retreat a little; upon which two field pieces were advanced directly to the enemy's first redoubt upon our right, took them in reverse, and fired very smartly both round and grape-shot upon the enemy for about half-an-hour, during which time several platoons, among whom were many of the Marines, advanced and strengthened the fire of the cannon. The enemy, being then apprehensive that they should be surrounded, retired precipitately out of the redoubt into the town, where the troops followed them to the entry of the suburbs, but perceiving at that time that no troops advanced to sustain them they halted and took post at the avenues of the grand street which leads to the citadel, posted safeguards at proper places, and by degrees advanced under cover of the houses farther into the town. The Marines, as usual, behaved remarkably well upon this occasion. The detachment with the two field pieces consisted of 16 men, 7 of whom were wounded and 2 killed. The redoubts upon the left being attacked at the same time, the enemy abandoned their strong outposts too precipitately, and retired into the citadel, by which means we got possession in about two hours of six strong redoubts, some batteries, and

[1] The siege had been actively carried on since the 4th May, but the engineers having pointed out that the lines could not be carried near to the place in consequence of the newly-constructed redoubts, it was settled that they should be assaulted on the 13th May.—R. H.

the town of Palais,[1] so that there was now only the harbour between us and the sedans or counter-guard of the Bastion du Cavalier ou du Roy. Our loss upon this occasion was very inconsiderable, but many of the enemy were killed, and 4 officers, 67 men, and 9 peasants were taken prisoners, with several pieces of cannon. The enemy soon after sent out a drum with letters to General Hodgson, one from Brigadier St. Croix, governor in the citadel, another from the chief magistrate of the town of Palais. The latter implored the protection of the English general for himself and the inhabitants of the town of Palais. The general returned for answer that if the Chevalier de St. Croix would withdraw his troops from the town, he would send safeguards to secure their persons and properties, but not before the enemy fired cannon and musketry the rest of the day. M. St. Croix complains highly of the ill-behaviour of his men in abandoning the redoubts so precipitately, and intimated that we shall find other sort of troops to deal with in the citadel. The taking of all the enemy's redoubts this morning put us in possession of a very advantageous and commanding spot of ground about 400 yards from the citadel, to form our second parallel on and erect batteries to destroy and batter in breach the enemy's works. The redoubts on the right were extremely strong, being fraised with a ditch and three lines of trou de Turc, and was not very tenable. But their whole line of defence from right to left, which was at the distance of about 500 yards from the citadel, which covered the town and occupied the spot of ground most proper for our approaches and batteries, was extremely strong and admirably well fortified. Their redoubts being closed at the gorge were of great service, as they covered us from the fire of the citadel. The prisoners taken all agreed that our shells had done great execution amongst them, and some of the French officers, describing the bombardment, expressed themselves thus, "*Que c'était un feu infernal, et qu'on ne voyait ciel ni terre,*" and for some days afterwards, when they saw an artillery officer walking the town, they called out from the citadel, "*Garde la bombe.*"

The outposts were now reduced as follows:—

	Sbltns.	Sergts.	Men.
The redoubt on the right - -	—	1	10
Village of Bertelot on the right of Marines - - - - - -	—	1	10
Village of Namscot in front of the Marines - - - - -	—	1	10
Village of Casperne in the rear of the Burnt Village - - - -	—	1	10
Village of Kergayet on the left of the ravine - - - - -	—	1	10
Redoubt on the left - - -	—	1	12
Village of Port Halan on the right of the trenches - - - -	1	1	30
	1	7	92

[1] The storming party on that occasion consisted of a portion of Loudoun's Regiment (30th) and a detachment of Marines, supported by Colvill's Regiment (69th).

The following numbers were sent to the posts in the redoubts taken possession of this morning :—

	F.O.'s.	Capts.	Sbltns.	Sergts.	Men.
Redoubt No. 1 by the windmill on the right - -	—	1	3	4	100
Redoubt No. 2 on the left of the above - - -	—	1	3	4	100
Small redoubt in front of the last - - - - -	—	—	1	2	40
Redoubt No. 3 on the right of the garden wall - -	1	2	6	8	200
Redoubt No. 4 on the left of the garden wall - -	1	2	6	8	200
Village of Raselure in front of M. Fouget's house -	—	1	3	4	100
Redoubt by the old tower on the left - - - -	1	2	6	8	200
Town of Palais - - -	2	6	18	24	600
For the trenches - - -	2	6	18	24	600
Total -	7	21	64	86	2,140

The general of the day was to be in the town of Palais.

The second battalion of Rufane's, Stuart's, and Grey's Regiments were ordered to furnish 4 captains, 12 subalterns, 18 sergeants, and 463 men as a working party at 5.30 at the head of Beauclerk's, where an engineer was to attend to conduct them. The commanding officer of artillery was ordered to deliver any quantity of cartridges that the commanding officers of regiments demanded upon taking their receipts for the number delivered. It was afterwards ordered that the piquet for the town of Palais should consist of 1 field officer, 3 captains, 9 subalterns, 12 sergeants, and 300 men. Brigadier-General Desaguliers ordered a captain of artillery to take the command of all the batteries in the trenches, and another to take the command of all the artillery in the village of Port Halan and advanced posts before it. This night the enemy hoisted for a signal to the Continent a light in two of the bastions. The commodore took a boat as it was coming out of Palais, in which was an officer with despatches for the Continent, but he threw his packet overboard. They took, however, several private letters, some from officers, in which it was said that the garrison expected to hold out long enough to obtain an honourable capitulation. We were extremely quiet on both sides all night.—*To be continued.*

NAVAL NOTES.

HOME.—The following are the principal appointments which have been made: Captains—F. Powell, C.B., to be Commodore of the 2nd Class in charge at Hong-Kong; H. J. May, C.B., to "Mars"; C. H. Cochran to "Pegasus"; F. J. Foley to "Pactolus"; A. C. B. Bromley to "Impregnable"; A. W. E. Prothero to "Arrogant"; J. Ferris to "Magnificent"; H. P. Williams to be Inspector of Warlike Stores; G. E. Richards to "Triton"; J. H. T. Burke to "Orlando"; E. H. Bayly to "Aurora"; H. C. B. Hulbert to "Pelorus." Commanders—W. G. Grogan to "Black Prince"; J. W. Combe to "Penguin"; A. L. K. Knapton to "Medusa"; A. Dodgson to "Sheldrake"; W. V. Anson to "Ganges"; R. J. O. Tupper to "Pylades"; H. G. King-Hall, D.S.O., to "Hearty"; R. B. Farquhar to "Nymphe"; C. G. May to "Medea"; H. Lyon to "Curaçoa"; J. G. Hewitt to "Caledonia."

General.—The First Reserve Squadron, which dispersed last month to give leave and have minor defects made good, is, according to present orders, to re-assemble again at Portland about the middle of the present month. The first-class cruiser "Theseus" commissioned at Chatham on the 17th ult., for service in the Mediterranean, where she will relieve a sister ship, the "Gibraltar." The third-class cruisers "Pegasus" and "Pactolus" also commissioned at Chatham on the 17th ult., the first-named proceeding to the south-east coast of America, where she will relieve the sloop "Basilisk," and the "Pactolus" joining the Channel Squadron. The sloop "Pelican" arrived at Plymouth on the 8th ult., and will pay off at that port.

Steam Trials.—The new first-class cruiser "Niobe," lately commissioned for the Channel, has not as yet made much progress with the series of steam trials ordered by the Admiralty, owing to a series of mishaps.

The new torpedo-boat destroyer "Bittern," built by Messrs. Vickers, Sons, and Maxim, has successfully completed her three hours' full-speed trial. The results were as follows:—Draught of water—5 feet 2¾ inches forward, 8 feet 4½ inches aft; speed of ship, 30·403 knots; steam pressure in boilers, 220 lbs. per square inch; air pressure in stokeholds, 4·0 inches; vacuum in condensers—23·4 starboard, 23·2 port; revolutions per minute—395·7 starboard, 392·2 port; mean I.H.P., 3,314 starboard, 3,345 port—total, 6,659. The contract stipulated for a speed of 30 knots, with 6,000-I.H.P. The new torpedo-boat destroyer "Flirt" has had a successful three hours' 30-knot trial; with the engines developing 6,682-I.H.P., and making 404 revolutions, with a steam pressure at the boilers of 232 lbs., she maintained a speed of 30·039 knots, which as the weather was very boisterous, was considered very satisfactory.

New Ships.—The supplemental programme of naval construction sanctioned by the House of Commons at Mr. Goschen's request on 22nd July last comprised four battle-ships, four cruisers, and twelve torpedo-boat destroyers. The contracts for the four battle-ships and two of the cruisers have now been given out. The Thames Ironworks and Shipbuilding Company has secured the contract for the construction of two of the battle-ships and their machinery, and the other two battle-ships with their machinery will be built by Messrs. Laird, of Birkenhead, and the Palmer Shipbuilding Company, at Jarrow. The contracts for the two first-class cruisers, which are to be of the large armoured type, foreshadowed by Mr. Goschen in his speech in the House last June, have been allotted to the

following firms: One to the Fairfield Company and the other to Vickers, Sons, and Maxim, at Barrow-in-Furness; while two others of a similar type are, it is reported, to be built at Devonport and Pembroke Dockyards respectively; the engines for the latter being supplied by Messrs. Humphreys, Tennant, and Co., of Deptford, London. Contracts for the remaining two cruisers, which will be of a somewhat smaller type, will be placed shortly.

The new battle-ships will differ somewhat from the "Formidable" class, but the differences will be mainly differences of detail. They will possess rather more speed than the "Formidable" class, and will draw somewhat less water. As Mr. Goschen significantly observed, "They will be more calculated to pass through the Suez Canal without lightening." Another point of difference is that the new battle-ships will carry slightly less armour. At present names have not been found for the new vessels. The fact that two of the new vessels are to be built by the Thames Ironworks Company is due entirely to tenders submitted, and with the exception of the "Albion," launched last year, will be the first important orders executed by that firm for the Government for some years. In the present instance a circumstance greatly in favour of the builders is that they have two vacant slips side by side, one recently occupied by the "Albion," and the other by the Japanese war-ship "Shikishima." The two vessels to be constructed will be absolutely in duplicate, and can therefore be completed more expeditiously and at less cost than if they were of a different class. All four battle-ships are to be delivered in two years and three months from the date of the order, and if possible they are to be completed at an earlier date.

The two new cruisers will be of an improved "Cressy" type, and will be the largest and most powerful vessels of their class as yet designed for any Navy. Their length between perpendiculars will be 500 feet; beam, extreme, 71 feet; mean draught, 26 feet; displacement, about 14,100 tons; speed, 23 knots; H.P., 30,000; armament, two 9·2-inch guns with armoured shields, sixteen 6-inch Q.F. guns in casemates, fourteen 12-pounder Q.F. guns, three 3-pounders, and two submerged torpedo-tubes. The protection to the 9·2-inch and 6-inch Q.F. guns will be equal to that provided in the "Powerful" and "Terrible." The guns will be of the more modern type adopted for the "Cressy" class, and of considerably greater power than those of any other cruiser. The 9·2-inch guns will be mounted in barbettes, protected by 6-inch nickel-steel armour, with 6-inch hoods; there will be four more 6-inch guns than in the "Cressy," and they will be mounted four on each side on the main deck in 6-inch casemates, and four immediately above them on the upper deck, similarly protected. The sides will be protected by 6-inch steel armour, extending forward to the ram, where it will be of somewhat lessened thickness, while at the after-end of the belt there will be an armoured athwartship bulkhead of 5 inches. There will be two armoured decks, the upper one horizontal, of 1-inch steel, and the lower turtle-backed, of 4-inch steel, tapering to 2 inches. The steel hulls will be unsheathed. The measured-mile speed on an eight hours' trial with natural draught will be 23 knots. The continuous sea-speed with smooth water will be 21 knots. Water-tube boilers will be adopted and twin screws. The capacity of the coal bunkers will be 2,500 tons, thus giving them a greater radius of action than the new cruisers of foreign Navies. Both ships are to be completed in two years and six months at the outside.

It will thus be seen that the new ships will be unexcelled both as regards protection and speed. It is true that both France and Russia are building a certain number of so-called 23-knot cruisers, but this speed is only to be maintained for 12 hours, and that through forced draught, while in our ships the 23 knots will be obtained under natural draught, and judging from the good results obtained from the "Terrible," there will in all probability be no difficulty in getting and maintaining this speed. On the other hand, the sea-speed (under natural draught) of both the French and Russian ships is only to be 19 knots as against the 21 knots

of our ships, and in this connection it may be as well to recall that quite lately the "Diadem" ran home from Gibraltar with a foul bottom at a mean speed of 19·7 knots.

White Star Steamer "Oceanic."—On the 14th January there was launched a steamship which exceeds in length all vessels that have preceded it in the history of maritime commerce, and the following details from the interesting account of her, which appeared in the *Times* of the 14th January, may be of interest to readers of the JOURNAL. The "Oceanic" has been built by Messrs. Harland and Wolff, of Belfast, for the White Star Line. She is a twin-screw, steel-built ship, 705 feet 6 inches over all and 685 feet between perpendiculars. Her moulded beam is 68 feet, to which may be added about 4 inches for skin plating to give the extreme beam. Her depth is 49 feet to the upper deck, but above this there are the promenade and boat decks. The draught of the ship when loaded will be 32 feet 6 inches, and her light draught when she is completed will be 22 feet, whilst her draught at launching was 14 feet 4 inches. The weight of this enormous ship and her cargo, stores, fittings, etc., will be 28,500 tons. That is what is known as the load displacement tonnage; the gross tonnage will be 17,040 tons, and the net registered tonnage 7,930 tons. The vessel will carry 410 first-class, 300 second-class, and 1,000 third-class passengers. With the ship's company of 394 all told, the grand total of 2,104 persons on board will be reached.

In recording the advent of another great steamship one's thoughts naturally revert to the "Great Eastern"; and this is the first time since that vessel was built that it has been possible to speak of a new steamer as "the largest ever constructed." It will be therefore interesting to give some particulars of the older ship for the purpose of comparison. Her length on the upper deck was 692 feet, whilst between perpendiculars it was 680 feet; she was, therefore, 13½ feet shorter than the "Oceanic." In regard to beam, the "Great Eastern" far exceeded the new White Star boat, being 83 feet on the beam, and, therefore, 15 feet the wider of the two. The depth of the "Great Eastern" was 58 feet, but that measurement was from her keel to her highest deck, whilst above the upper deck of the White Star ship there are a promenade deck and a boat deck. The displacement of the "Great Eastern" is generally given as 22,500 tons, but we have been unable to find out to what draught this corresponded. It is said, however, that the weight of the ship and engines at the time of launching was 12,000 tons; the weight of iron in the hull is put down at 8,000 tons, and the capacity for coal and cargo is stated at 18,000 tons. If we add the weight of ship and engines to the latter figure we get a displacement of 30,000 tons, which is somewhat greater than that of the "Oceanic."

The steamer that most nearly compares in size with the two vessels already mentioned is the German-built and German-owned "Kaiser Wilhelm der Grosse." She is 625 feet long, 66 feet beam, and 43 feet deep. Two vessels next again in size are the Cunard steamers "Campania" and "Lucania," built at Fairfield on the Clyde. They are practically sister ships. The "Campania" is 600 feet long, 65 feet beam, and 41 feet 6 inches deep. The "Teutonic" and "Majestic," the two White Star vessels which were previously the longest afloat, were 565 feet long, 57 feet 6 inches beam, and 42 feet deep. The "Oceanic's" weight as she lay on the stocks was, approximately, 11,000 tons. It was, as we have seen, 1,000 tons short of the weight of the "Great Eastern" with machinery, but the weight of iron alone in the hull of the older ship was but 8,000 tons. The "Oceanic" was launched with only her propellers and propeller shafts in place, but these will not add any very considerable increase to the total weight. It is difficult to arrive at a definite conclusion as to the respective weights of the hulls of the two ships, but it would appear on the figures quoted that the "Oceanic" is the heavier, in spite of her less beam. However this may be, there is no doubt that the "Oceanic" is a wonderfully staunch-built ship, features having been introduced into her structure which are of quite an unusual character, simply

to give additional stiffness. She has seven decks in all—viz., a boat deck, promenade deck, upper deck, middle deck, lower deck, orlop deck, and lower orlop deck. The last mentioned is only worked in in the forward part of the vessel, and does not extend to the after part. The boat deck, also, does not run the whole length of the ship, but only over the middle portion. All these decks, however, are steel-plated throughout, and there are five of them that extend throughout the length of the ship.

The interior of a modern steamship in her launching condition is neither a very interesting nor a very attractive object, excepting, of course, to the naval architect, and then only if she has incorporated in her design some novelties of construction. The latter the "Oceanic" undoubtedly has, and we will confine our attention chiefly to them. Strength and rigidity are the features to which Mr. Ismay, representing the purchasers, and Mr. Pirrie, representing the builders of the ship, have chiefly turned their attention in settling the elements of design. One of the chief means by which Messrs. Harland and Wolff have ensured these features has been by a very extensive use of the system of hydraulic riveting. Of course this is no new thing in ship construction, but its application has been mostly confined to certain parts of vessels on account of the great weight involved in producing a hydraulic riveter long enough in the "gap" to reach the greater part of the work. For boiler riveting hydraulic machines are almost wholly used by the largest and best firms of engineers, but to manipulate a fixed riveter into the jaws of which the boiler shell can be lowered by means of a powerful permanent crane is a very different thing from traversing these massive riveters from end to end of the 700-foot ship. In order, however, to carry out Mr. Pirrie's designs it was absolutely essential that hydraulic riveting should be adopted. In the first place, nothing but steel rivets were to be used, and these, as is well known, are harder to close than iron rivets. Beyond this, however, the exceptional doubling of the plating, to which further reference will be made, and the special form of keel, also to be described, necessitated the use of very long rivets, and this in turn demanded that they should be of large diameter, but the difficult problem of transporting the riveting machines was fortunately solved in a very satisfactory manner.

The "Oceanic" has the cellular double bottom which is now almost universal in all large passenger-ships as well as in war-vessels. In the present case, however, this raft-like structure extends from end to end of the vessel, going right up into the fore and after peaks. The keel design is somewhat unusual. There is, first of all, an outside keel consisting of a flat bar of steel, built up in suitable lengths. It is 18½ inches wide and nearly 4 inches deep. Above this is a horizontal "plate" keel—that is to say, what would be the port and the starboard garboard strakes with ordinary bar keels are formed of plates that extend along the middle line of the bottom of the ship. These plates are 53 inches wide, 30 feet long, and 1⅝ inches thick. Above this plate keel, and therefore, of course, on the inside of the ship, is the inner vertical keel, or keelson. It is 5 feet in vertical extension over the greater part of the ship's length, but is increased to 7 feet under the machinery compartment. This inner keel or middle line keelson, together with the plate keel, takes the shape therefore of an inverted 1, and forms what may be described as the backbone of the ship. The bar keel and the plate keel are attached to the inner vertical keel by means of angle bars riveted on to the latter, the three being fastened together by steel rivets 1¼ inches in diameter and 7 inches long. It was to close these in a thoroughly efficient manner that the exceptional hydraulic machinery was installed, but hydraulic riveting is used for the whole of the cellular structure of the double bottom, for the doubled plating, and the other parts to which reference will be made.

It has been said that the midship section of the "Oceanic" is approximately square, there being no more than 2 feet rise of floor. This section is carried far forward and aft without any great variation in form, and thus the middle part of

the vessel may be roughly likened to an enormous box girder. In order to get the full advantage of this very strong form of structure the corners of the girder have been additionally strengthened, the strake of plating which adjoins the upper deck, as also the strake next but one below it, being doubled throughout the greater part of the length of the ship. The upper deck plates at the sides, or what are known as the upper deck stringers, are also of two thicknesses of plating. The corresponding corners at the bottom of the girder—that is to say the bilges—are also double plated, and the strength here is increased by two long bilge keels, 18 inches deep, which run through the greater length of the vessel. In this way a section is obtained which affords great strength and stiffness in both the vertical and the horizontal planes. This doubling of the plating could hardly have been obtained without the aid of hydraulic riveting—in fact, the expedient would have been of doubtful utility if attempts had been made to secure it by hand riveting. In a design of this nature it is desirable that the doubled plates should be pressed together with great force, so as to prevent their sliding on each other as the ship works, thus bringing a sheering action upon the rivets. With hand riveting the stem of a rivet may be stretched as it cools, and thus the plates come a little apart. The hydraulic machine, however, holds the plates together with immense force until the rivets are cold and their full tensile resistance is thus reached. The difference between intermittent blows and steady pressure in this respect will be at once apparent.

The "Oceanic" will be propelled by two pairs of three-stage compound inverted four-crank engines. The diameter of the cylinders will be:—High pressure 47½ inches, intermediate pressure 79 inches, and two low-pressure cylinders of 93 inches. The stroke will be 72 inches. The disposition of the cylinders is somewhat unusual, resembling that adopted by Messrs. Yarrow, Schlick, and Tweedy in their system of balancing, which is now so largely used in order to prevent vibration due to the motion of working parts in engines on steamships. There are 15 boilers of the ordinary return-tube type, the largest being 16 feet 6 inches in diameter; the steam pressure will be 192 lbs. to the square inch. On the question of speed the builders prefer to be reticent. The "Oceanic" has not engine power enough to promise that she will "break the record," to adopt a phrase which has found its way from the racing path to the annals of steam navigation. Although the model of the ship is one calculated to give speed—a fact proved by the performance of former White Star vessels—the engines are scarcely big enough to exert the enormous power required for the excessive speed now attained by the fastest vessel crossing the Atlantic. Probably the "Oceanic" will not be very far behind the record, but it is unwise to prophesy before one is sure. The ship has been designed so that she may, leaving Liverpool on Wednesday afternoon, arrive in New York at 8 o'clock on the following Wednesday morning. To get there a little earlier would not be of much advantage, as the passengers would have to sleep on board on Tuesday night in any case, whether the ship were at anchor or on the ocean. To make the "Oceanic" the champion of the Atlantic would need an enormous addition to the machinery; for in steam navigation it is the last increment of speed that entails the greatest addition to power; thus to progress, say, from 17 to 18 knots may mean an addition of but 10 or 15 per cent. of the power exerted, but to advance from 21 to 22 knots might need an increase of 30 or even 40 per cent. of power, and, of course, a corresponding space to be occupied by machinery, coal, stores, etc. It is not this, however, that has so much influenced the owners and designers in producing a vessel which is, in these days of high steaming, of moderate speed for her length. The chief aim of Mr. Ismay has been to provide a comfortable ship, and in order to secure this end absence of vibration is absolutely necessary. The rigid structure of the hull, moderate power, and balanced engines have been adopted chiefly with this view. The "Oceanic" is also designed to be a punctual ship; for her large size and special shape will result in heavy seas having little effect on her, whilst the

moderate power will not make it necessary to slow down in stormy weather.—*Précis from the Times.*

GENERAL.

The war-ships, exclusive of torpedo-boats, launched during the year 1898 for the various Navies, with their tonnage, I.H.P., and estimated speed were as follows :—

Great Britain.—First-class battle-ships :—"Formidable," "Irresistible," both of 15,000 tons, 15,000-I.H.P., and 19 knots speed; "Albion," "Goliath," "Ocean," of 12,950 tons, 13,500-I-H.P., and 18 knots speed. First-class cruisers :—"Amphitrite," "Argonaut," "Ariadne," "Spartiate," all of 11,000 tons, 18,000-I.H.P., and 20·7 knots speed. Second-class cruisers :—"Hermes," "Highflyer," "Hyacinth," all of 5,750 tons, 10,000-I.H.P., and 20 knots speed. Third-class cruisers : — "Psyche," "Prometheus," "Pioneer," all of 2,135 tons, 7,000-I.H.P., and 20 knots speed. Sloops :—"Condor," "Rosario," of 960 tons. 1,400-I.H.P., and 13·2 knots speed. First-class gun-boats :—"Bramble," "Britomart," "Dwarf," "Thistle," of 700 tons, 13,000-I.H.P., and 13·5 knots speed. River gun-boat :—"Snipe," of 80 tons, 240-I.H.P., and 9 knots speed. Torpedo-boat destroyers :—"Albatross," "Bullfinch," "Cygnet," "Cynthia," "Dove," "Leven," "Mermaid," "Orwell," of 300 tons, 6,000-I.H.P., and 30 knots speed.

Austria-Hungary.—First-class armoured cruiser :—"Kaiser Karl VI.," of 6,250 tons, 12,300-I.H.P., and 20 knots speed.

Brazil. — Coast-defence turret-ship : — "Marechal Deodoro," of 3,162 tons, 3,400-I.H.P., and 16 knots speed. Torpedo-cruiser :—"Tamoyo," of 1 030 tons, 6,000-I.H.P., and 23 knots speed.

Bulgaria.—Torpedo-aviso :—"Nadiedja," of 715 tons, 2,600-I.H.P., and 17 knots speed.

China.—Second-class cruiser :—"Hai Chi," of 4,300 tons, 17,000-I.H.P., and 24 knots speed. Third-class cruiser :—"Hai Shen," of 2,950 tons, 8,000 I.H.P., and 19·5 knots speed. Torpedo-boat destroyers :—"Hai Ching," "Hai Hoa," "Hai Fiju," of 250 tons, 6,500-I.H.P., and 32 knots speed.

France.—First-class battle-ship :—"Iéna," of 12,052 tons, 15,500-I.H.P., and 18 knots speed. First-class cruiser :—"Châteaurenault," of 8,300 tons, 24,000-I.H.P., and 23 knots speed. Second-class cruiser :—"Amiral-Protet," of 4,065 tons, 9,000-I.H.P., and 20 knots speed. Torpedo-avisos :—"Durandal," of 300 tons, 4,800-I.H.P., and 26 knots speed ; "La Hire," of 896 tons, 7,000-I.H.P., and 23 knots speed.

Germany.—Second-class cruisers :—"Hansa," "Vineta," of 5,630 tons, 10,000-I.H.P., and 20 knots speed. Fourth-class cruiser :—"Gazelle," of 2,650 tons, 6,000-I.H.P., and 20 knots speed. First-class gun-boat :—"Iltis," of 895 tons, 1,300-I.H.P., and 13·5 knots speed.

Italy.—Second-class cruiser :—"Puglia," of 2,550 tons, 7,000-I.H.P., and 20 knots speed.

Japan.—First-class battle-ship :—"Shikishima," of 14,850 tons, 14,500-I.H.P., and 18·5 knots speed. First-class armoured cruisers :—"Asama," "Tokiwa," of 9,750 tons, 18,000-I.H P., and 21 knots speed. Second-class cruisers :—"Chitose," "Kasagi," of 4,900 tons, 16,500-I.H.P., and 22·5 knots speed. Torpedo-boat destroyers :—"Murakumo," "Shinonome," of 275 tons, 5,500-I.H.P., and 30 knots speed; "Ikadsuchi," of 300 tons, 6,000-I.H.P., and 30 knots speed.

The Netherlands.—Second-class cruisers:—"Gelderland," "Utrecht," of 3,950 tons, 9,750-I.H.P., and 20 knots speed. First-class gun-boats:—"Koetei," "Siboga," of 820 tons, 1,200-I.H.P. and 12 knots speed.

Portugal.—Second-class cruiser:—"Don Carlos I.," of 4,200 tons, 15,000-I.H.P., and 22 knots speed. Third-class cruiser:—"Sao Gabriel," of 1,800 tons, 2,650-I.H.P., and 17 knots speed. First-class gun-boats:—"Almirante Baptista de Andrade," "Thomaz Andrea," of 220 tons, 480-I.H.P., and 11 knots speed.

Russia.—First-class armoured cruisers:—"Osliablia," "Peresviet," of 12,700 tons, 14,500-I.H.P., and 20 knots speed. Second-class cruisers:—"Aurora," "Diana," "Pallada," of 6,500 tons, 11,000-I.H.P., and 21 knots speed. Torpedo-boat destroyers:—"Berlsonte," "Condor," "Nyrok," "Yastreb," of 320 tons, 6,000-I.H.P., and 30 knots speed.

Spain.—Third-class cruiser:—"Rio de la Plata," of 1,800 tons, 7,100-I.H.P., and 20 knots speed.

Sweden.—Coast-defence turret-ship:—"Thor," of 3,400 tons, 3,700-I.H.P., and 16 knots speed. Torpedo-aviso:—"Psilander," of 670 tons, 4,000-I.H.P., and 20 knots speed.

United States.—First-class battle-ships:—"Kearsarge," "Kentucky," of 11,520 tons, 11,000-I.H.P, and 17·5 knots speed; "Alabama," "Illinois," "Wisconsin," of 12,300 tons, 11,000-I.H.P., and 17·5 knots speed. Torpedo-boat destroyer:—"Farragut," of 273 tons, 6,000-I.H.P., and 30 knots speed.

FRANCE.—The following are the principal promotions and appointments which have been made: Rear-Admiral—A. P. L. Bienaimé to command of the Naval Division for the Superior School of the Navy. Capitaines de Vaisseau—L. G. Billard to Rear-Admiral; P. A. B. Hennique to "Nielly" and command of Newfoundland Naval Division; L. J. Berryer to "Amiral-Charner." Capitaines de Frégate—E. P. Simon, J. A. Mallet to Capitaines de Vaisseau; P. Adigard to "Davout"; C. X. Ridoux to "D'Assas"; J. B. Arden to command of *Défense-Mobile* at Toulon; E. Nicol to be Chief of the Staff to Rear-Admiral Bienaimé.—*Journal Officiel.*

General.—Rear-Admiral Bienaimé, who is appointed to the command of the Training Division, appropriated for instructional purposes to the École Supérieure de la Marine (Naval Staff College), is to hoist his flag on board the first-class armoured cruiser "Amiral-Charner," the remaining vessels of the squadron will be the second-class cruisers "Davout" and "Friant"; the squadron is to assemble at Brest on the 15th March; five lieutenants from the École are to be attached to each cruiser. Vice-Admiral Sallandrouze de Lamornaix, in command of the Northern Squadron, has temporarily shifted his flag to the first-class battle-ship "Amiral-Baudin," while the "Formidable" is in the dockyard hands at Brest. Rear-Admiral Escande, in command of the Atlantic Division, will return to Brest in the spring, when he is probably to be succeeded in the command by Rear-Admiral Gigon. The old wooden second-class cruiser "Dubourdieu," which has served as flag-ship of the squadron for the last three or four years, is to be relieved by the first-class cruiser "Cécille," which, although not a new ship, is a powerful and fast cruiser of 19 knots. The first-class armoured cruiser "Bruix" and the second-class cruiser "Du Chayla" are to be transferred from the Mediterranean to the Northern Squadron, as soon as they have completed their refit at Toulon. The coast-defence battle-ship "Terrible" has been commissioned and is to be attached to the division under the command of Rear-Admiral Caillard, which will then be composed of six vessels of that class, viz., the "Bouvines," "Valmy," "Jemmapes," "Tréhouart," "Caïman," and "Terrible." The division for the Newfoundland

Fisheries will consist of the third-class cruiser "Nielly," carrying the broad pennant of the senior officer, and the despatch-vessels "Manche" and "Fulton."

New Ships.—The new first-class battle-ships "Charlemagne" and "Gaulois" are still waiting at Brest for the mounting of their heavy guns. The guns themselves are ready and lying in the dockyard, but neither the turrets nor the mountings are yet complete, and no date has yet been named when the work will be finished. The "Charlemagne" was commenced more than five years and launched nearly four years ago, and the "Gaulois" a year later.

The first keel-plate of the new first-class battle-ship "Suffren" has been laid on the slip, from which the "Iéna" was launched, at Brest dockyard on the 1st September last; the work on her is to be pushed on as rapidly as possible, and it is hoped she may be ready for launching in eight months' time. The displacement of the "Suffren" will be 12,750 tons, and she will be the largest battle-ship as yet constructed for the French Navy; the *Yacht* points out that she is nevertheless much smaller than the battle-ships being built for other Powers, and regrets that the Minister of Marine has not as yet authorised the preparation of plans for a larger and more powerful vessel.

Trials.—The new first-class cruiser "D'Entrecasteaux" has at last satisfactorily concluded her trials. During a 24 hours' run under natural draught the engines developed 8,500-I.H.P., giving a mean speed of 17·8 knots, with 96 revolutions; the coal consumption was only 718 grammes per H.P. per hour. During her two hours' full-speed trial under forced draught the engines developed 14,360-I.H.P., a mean speed of 19·2 knots being obtained; although on this last occasion the engines developed 360-H.P. over the contract, and 1,500-I.H.P. over the H.P. developed at the previous full-speed trial, yet the increase of speed was only ·2 of a knot.

The submarine torpedo-boat "Gustave Zédé," referred to in last month's Notes, is reported to have had a further satisfactory trial at Hyères in conjunction with the battle-ship "Magenta," and in the presence of the Minister of Marine. On a signal to attack the battle-ship being made, the "Gustave Zédé," which was floating with only her cupola showing, disappeared, and re-appearing again shortly afterwards to rectify her direction, she took a final dive, and when at a distance of 400 metres from the ship, fired a torpedo which struck the battle-ship amidships under the funnel. Though the men were at their quarters with guns trained and expecting the attack, it is said that at no period of her approach could they have succeeded in hitting the "Gustave Zédé," her appearance being of so short duration and the mark afforded by the cupola so small. M. Lockroy afterwards examined the "periscope," an instrument invented by a naval lieutenant for directing the course of a submarine boat.

On the 10th January the "Gustave Zédé" had a satisfactory trial of her sea-going qualities. Leaving Toulon at 5 a.m. she arrived at Marseilles at 1 p.m., the distance being about 40 miles; there was a slight sea on and she was accompanied by a tug, whose services, however, were not required, and the submarine boat behaved admirably.

The Superior Council of the Navy.—The new Conseil Supérieure de la Marine, as reconstituted by the decree of 23rd November last, assembled for the first time, under the presidency of M. Lockroy, on 12th January. It was attended by all vice-admirals who had served afloat as commander-in-chief of a fleet, by the five maritime prefects, and by the vice-admirals in command of the Northern and Mediterranean Squadrons.

The following are the principal changes to be made during the next three months:—

Cherbourg.—The torpedo-boat destroyer "Dunois" and the new torpilleur-de-haute-mer "Cyclone" are to be commissioned at the conclusion of their trials for service with the Mediterranean Fleet, where they will relieve sister vessels. The

torpedo-aviso "Lance" commissions to relieve a sister ship, the "Bombe," at Constantinople. The second-class cruiser "Catinat" is to be detached from the Squadron of the North in March, and placed in the 2nd Category of the Reserve. The despatch-vessel "Brandon" commissions for service at Senegal. The torpedo-cruiser "Fleurus" commissions to relieve the "Épervier," a similar ship, in the Squadron of the North, and the new torpedo-boat destroyers "Durandal" and "Hallebarde" are to commission for their trials.

Brest.—The despatch-vessel "Kersaint" leaves to relieve the "Bengali" in Tonkinese waters. The second class cruiser "Friant" commissions this month for service with the Squadron of Instruction for the Naval Staff School. The third-class cruiser "Nielly" commissions in March for the Newfoundland Fishery Squadron.

Lorient.—The despatch-vessels "Ardent" commissions for service in Senegal and the "Manche" for service on the Newfoundland Fisheries.

Rochefort.—The despatch-vessel "Rance" commissions for surveying service in Madagascar. The second-class cruiser "Davout" commissions this month for service with the Squadron of Instruction for the Naval Staff School. The new second-class cruiser "Amiral-Protet," if her trials are concluded, commissions in March to relieve the "Catinat" in the Squadron of the North. The despatch-vessel "Durance" from Senegal pays off in April.

Toulon—The first-class cruiser "D'Entrecasteaux" commissions to relieve the cuirassé-de-croisière "Vauban" as flag-ship in China. The second-class cruiser "Bugeaud" and the torpedo-aviso "Faucon" pay off into the 2nd Category of the Reserve. The first-class cruiser "Cécille" commissions as flag-ship of the North Atlantic Division. The despatch-vessel "Chimère" commissions for surveying service, and the "Bombe" from Constantinople pays off.

Cochin-China.—The cuirassé-de-croisière "Vauban," after relief by the "D'Entrecasteaux," relieves the "Triomphant" as guard-ship at Saigon, the latter paying off into the Reserve, the despatch-vessel "Bengali," after relief by the "Kersaint" in Tonkin, also pays off into Reserve at Saigon.—*Temps* and *Moniteur de la Flotte.*

The Naval Estimates.—The Estimates for the Navy for 1899 amount to 394,078,400 francs (£16,500,000), or over 17,000,000 francs (£680,000) more than for the current year. Of this amount, 96,000,000 francs (£3,840,000) are for new ships, 17,000,000 francs (£680,000) for repairs and modifications, and 3,000,000 francs (£12,000) for general service expenses. According to Annexe H of the Budget, provision is made for the completion, construction, etc., of 118 vessels, as follows:—7 battle-ships, 13 armoured cruisers, 6 cruisers, 2 cruiser-despatch-vessels, 1 despatch-vessel, 2 gun-boats, 1 transport, 8 submarine boats, 12 torpedo-boat destroyers, 11 torpilleurs-de-haute-mer, 10 squadron torpedo-boats, 39 first-class torpedo-boats, and 6 smaller torpedo-boats for ships. The vessels charged to the dockyards for construction are 37—viz., 7 battle-ships, 7 armoured cruisers, 2 cruisers, 1 cruiser-despatch-vessel, 1 despatch-vessel, 2 destroyers, 2 gun-boats, 1 transport, 8 submarine boats, and 6 torpedo-boats. Several of the ships, however, which figure in the Annexe are practically finished, to the number of 17—viz., the first-class battle-ships "Charlemagne" and "Gaulois," the first-class cruiser "Guichen," the second-class cruiser "Amiral-Protet," the despatch-vessel "Kersaint," the torpedo-boat destroyers "Dunois" and "Durandal," the torpilleur-de-haute-mer "Cyclone," and the first-class torpedo-boats Nos. 212, 213, 214, 215, 219, 220, 227, 230, and 233.

Of the remaining 91 vessels, 63 are actually in course of construction, and their dates for completion are as follows:—

In 1899.—The first-class battle-ship "Saint Louis" (April); the first-class cruiser "Châteaurenault" (July); the third-class cruisers "Infernet" and "D'Estrées" (June and August); the destroyers "Hallebarde" (January),

"Fauconneau" (April), "Espingole," "Framée," and "Pique" (June), "Épée" and "Yatagan" (October), "La Hire" (at end of year); first-class gun-boat "Décidée" (end of year); submarine boat "Morse" (May); and the following torpedo-boats at different dates: Nos. 223, 224, 225, 226, 228, 229, 231, 232, 234, 235, 236, 237, 238, 239, 240, 241, and 243; and the small ship torpedo-boats D, E, F, G, H, and I.

In 1900.—The first-class battle-ship "Iéna" and the second-class battle-ship "Henri IV." (July); the first-class cruiser "Jurien-de-la-Gravière" (end of year); the first-class gun-boat "Zélée" (end of year); the submarine boat "Narval" (end of year); the squadron torpedo-boats "Siroco" (April), "Mistral," "Simoun," and "Trombe" (June), "Typhon" (September), and "Audacieux" (October).

In 1901.—The first-class battle-ship "Suffren" (July); the armoured cruisers "Montcalm" (April), "Desaix" (May), "Kléber" (July), "Jeanne d'Arc," "Dupetit Thouars," and "Amiral Gueydon," all at the end of the year; the transport "Vaucluse" and torpedo-boat No. 142, also at end of the year.

In 1902.—The armoured cruisers "Condé," "Gloire," "Dupleix," and "Sully," towards the end of the year.

—*Annexe H, Budget des Dépenses du Ministère de la Marine.*

GERMANY.—The following are the principal appointments which have been made: Kapitäns zur See—Westphal for charge of steam-trials at Kiel; Koellner to command of Second Dockyard Division; Galster to be Captain of the Port at Kiel; Holzhauer for service at the Ministry of Marine. Korvetten-Kapitäns—Lans to "Iltis"; Brussatis for service at Kiel Dockyard; Mandt to Assistant-Superintendent of Dockyard at Wilhelmshaven; Schröder to Assistant-Superintendent of Dockyard at Kiel.—*Marine-Verordnungsblatt.*

Trials.—The new first-class gun-boat "Iltis," before leaving for China, had a successful trial, an average of 13·5 knots being maintained. The new division boat "D 10," built by Thornycroft, has been continuing her trials successfully, which have been of a very severe nature; at the three hours' forced-draught trial on the Eckenförde measured mile a mean speed of 27·7 knots was maintained, which was slightly over the contract speed. The trials of the new third-class cruiser "Gazelle" have commenced; it is hoped that a speed of 19 knots under forced draught will be reached. The new first-class battle-ship "Kaiser Friedrich III.," whose trials have been interrupted owing to a slight boiler defect, will renew them at the end of the present month. At the beginning of March the new second-class cruiser "Freya" comes to Kiel from Danzig, and will begin her trials.

The Naval Manœuvres of 1898.—Last year's naval manœuvres lasted from the 15th August to the 15th September, and were, as usual, under the supreme direction of Admiral Knorr, the Commanding Admiral of the Navy, who, as in previous years, hoisted his flag on board the sea-going torpedo-school ship "Blücher," to which, for despatch duties, was attached torpedo-boat No. 65.

The first squadron, consisting of two divisions, was under the command of Vice-Admiral Thomsen, with his flag in the "Kurfürst Friedrich Wilhelm"; the Second Division being under the command of Rear-Admiral Bendemann, with his flag in the "Baden," the two divisions being composed as follows:—

First Division:—

First-class battle-ships—"Kurfürst Friedrich Wilhelm" (*Flag Ship of Commander-in-Chief*), "Wörth," "Brandenburg," "Weissenburg."

Despatch-vessel—"Greif."

Second Division :—

Third-class battle-ships—"Baden" (*Flag Ship of Rear-Admiral*), "Baiern," "Oldenburg."

Despatch-vessel—"Hela."

Torpedo-boat Flotilla :—

Division boat—"D 9" (*Senior Officer*).

Division A. Torpedo-boats—"D 4," 82, 83, 84, 85, 86, 87.

Division B. Torpedo-boats—"D 8," 67, 68, 69, 70, 71, 72, 73.

The torpedo-boat depôt-ship "Pelikan" was also attached to the squadron.

The second squadron was under the command of Rear-Admiral Hoffmann, who had his flag in the "Ægir," with Captain Geissler as his second-in-command, who had his broad pennant flying on the "Frithjof," as flag-ship of the Fourth Division, and was constituted as follows :—

Third Division :—

Coast-defence battle-ships—"Ægir" (*flag*), "Odin," "Hagen."

Despatch-vessel—"Pfeil."

Second Division :—

Coast-defence battle-ships—"Frithjof" (*flag*), "Beowulf," "Heimdall."

Despatch-vessel—"Blitz."

Division boat "D 3" was attached for special duties to "Ægir."

Torpedo-boat Flotilla :—

Division C. Division boat "D 6." (*Senior Officer*); torpedo-boats 7, 8, 9, 10, 11, 12, 13.

Division D. Division boat "D 8"; torpedo-boats 15, 16, 17, 18, 19, 21.

A fifth squadron, under the command of Captain von Maltzahn, was formed of the sea-going training-ships "Stosch," "Charlotte," and "Moltke," with the armoured gun-boats "Mücke," and "Natter," which took part in the earlier part of the manœuvres between the 14th and 24th August; while the two tenders to the gunnery school-ship "Mars"—the "Carola" and "Hay"—took part in the later manœuvres of the squadron between the 10th and 17th September. The manœuvres were divided into two periods.

First Period.

On the 15th August the whole fleet, accompanied by the torpedo-boat flotillas, weighed from Kiel, where the ships had assembled, and proceeded to sea; on gaining an offing the two squadrons separated, and for two days were exercised independently at Fleet Tactics.

On the 17th the two squadrons, now united again, anchored off the coast of Schleswig-Holstein. On the 17th and 18th the whole fleet was exercised at Fleet Tactics together, the school-ships "Stosch," "Moltke," and "Charlotte" taking part, returning to Kiel on the evening of the 19th to coal, etc.

On the 22nd the fleet was exercised in scouting, the enemy being represented by the "Ægir" and the three training-frigates, who were to try and establish an effective blockade of the port, but the defending cruisers soon got in touch with them, and their purpose was easily frustrated. The fleet anchored for the night off Fehmarn. During the 23rd and 24th the fleet was divided into two squadrons (the Eastern and Western), to operate against each other; the Western under the command of Admiral Thomsen, consisted of the first squadron, reinforced by the "Hagen" and "Beowulf," with eight other vessels to act as scouts. The Eastern Squadron, under the command of Rear-Admiral Hoffmann, consisted of the remaining battle-ships of the Second Squadron, and were supposed to represent first-class ships, the scouting duties being carried out by the second torpedo-boat flotilla.

The object of the Eastern Squadron (Russian) was to join hands with another squadron (French), which was to the west of the Western Squadron (German),

and to effect this without engaging the German Fleet. The object of the German Fleet was to prevent the Russian passing to the west and effecting a junction with its allies. The field of operations was comprised between the meridian of Arcona and a line joining Adlergrund and Bornholm. During the night of the 24th the Russian Squadron arrived off Hela, and the German off Arcona. Leaving Sassnitz at noon on the 25th, Admiral Knorr, the Director-in-Chief of the Manœuvres, proceeded to the theatre of war, where he learnt that the German Fleet on the same morning was in the vicinity of Adlergrund, with its cruisers spread in all directions to find the enemy. The only information he could obtain of the enemy was that he had quitted Hela, shaping a course to the westward. During the evening of the 25th the German cruisers succeeded in getting in touch with the enemy, but were driven off by the torpedo-boats, two of the latter, however, being placed out of action. Profiting by this diversion, Rear-Admiral Hoffmann suddenly altered his course, but he was soon again discovered, and finding it impossible to slip by, he returned towards his point of departure, where he was shortly blockaded by his opponents. At the conclusion of the operations the whole fleet proceeded to Neufahrwasser for coal and stores, leaving again early on the 30th for Kiel, where they arrived on the morning of the 1st September, experiencing bad weather *en route*, which compelled the Division boat "D 5" and two other torpedo-boats to take shelter under Moën Island on the Danish coast, while No. 85 was lost off Fehmarn, through a heavy sea breaking over her funnels and filling the stokeholds, the crew being fortunately saved by Division boat "D 4." A number of attacks were also made during the first period of the manœuvres by the torpedo-boat flotillas on the ships of the squadron, by night, both when they were at anchor and under way.

SECOND PERIOD.

The fleet received orders to proceed through the Kaiser-Wilhelm Canal and rendezvous at Heligoland. The operation of passing through the canal was accomplished in 18 hours, and on the 2nd, with the exception of some of the torpedo-boats, the fleet was concentrated off the island. From the 3rd to the 9th, Fleet Tactics and other exercises were carried out. On the 9th the ships anchored off Wilhelmshaven to carry out the last theme of the manœuvres, which included an attack upon that maritime fortress and a blockade of the North Sea littoral.

According to the instructions issued, the German Fleet had been beaten and the command of the sea was in the hands of the enemy. The two squadrons were constituted as follows:—

The Yellow (the enemy) under the command of Vice-Admiral Thomsen.

First Division:—

Battle-ships—"Kurfürst Friedrich Wilhelm," "Brandenburg," "Weissenburg," "Wörth."

Second Division:—

Battle-ships—"Baden," "Baiern," "Oldenburg."

Third Division:—

Battle-ships—"Ægir," "Odin," "Hagen."

Light Division:—

Torpedo transport—"Pelikan."

Despatch-vessels—"Greif," "Pfeil," "Blitz."

Torpedo Division boat—"D 3," with the first torpedo-boat flotilla.

All the ships of the enemy flew a yellow distinguishing flag under their colours.

The German Fleet was under the command of Vice-Admiral Karcher, commanding at Wilhelmshaven, who had at his disposal the land forces and the following ships:—

"Frithjof," "Beowulf," "Heimdall," "Carola," considered first-class battle-ships, representing a squadron of four modern coast-defence battle-ships.

Armoured gun-boats—"Mücke," "Natter."

Cruiser—"Grille," and the second torpedo-boat flotilla.

Its duty was to guard the mouths of the Elbe, Weser, and Jahde; for this purpose the battle-ship division with the "Grille" were stationed at Cuxhaven at the mouth of the Elbe, the torpedo-boat flotilla in the Weser, and the coast-defence squadron in the Jahde, while all the signal stations from Wangeroog to Amrun were mobilised.

On the morning of the 13th September the Second Division of the enemy, with the cruiser "Pelikan," were off the Jahde; the "Oldenburg" with the "Pelikan" were sent in to attack the forts and ships, but they were ruled out of action by the umpires, and declared *hors de combat* in consequence of the heavy fire to which they were exposed from the defence, the ships of the defending squadron being so anchored as to cover and be covered by the forts. The enemy's Third Division lay off the Weser, and the "Hagen," accompanied by the "Pfeil," succeeded in destroying several signal stations and small posts, but, in spite of the favourable weather, they failed in discovering and destroying the torpedo-boats. Off the mouth of the Elbe lay the First Battle-ship Division of the enemy; on the previous day the admiral had had the whole coast-line and islands thoroughly reconnoitred between the Danish and Dutch frontiers and the Elbe, in order to find any trace of the defending force. After ascertaining that no ships or torpedo-boats lay off Heligoland, the enemy, keeping clear of the fire of the forts, proceeded to destroy the cable communication of the island with the mainland. A strict blockade was also maintained, all steamers approaching the harbours being brought to. On the 15th a combined attack by the whole of the Yellow Fleet was made on the outlying fortifications of Wilhelmshaven; during the following night the fleet, with the exception of the cruisers, stood out to sea to avoid any danger from an attack by the defending torpedo-boats; on the next day the attack was renewed, the channel into the river having been first buoyed by the small cruisers; at sundown the hostile fleet, with the exception of the cruisers, anchored out of range of the forts to the north of Wilhelmshaven. Four of the battle-ships were ruled out of action by the umpires, as the result of the two days' action with the forts. During the ensuing night an attack on the fleet was made by the defending torpedo-boat flotilla, but they were discovered by the cruisers, and soon brought under the search-lights and guns of the battle-ships. A scene of considerable confusion ensued. It is impossible to say how far the attack would have been successful in actual war, but it is quite certain that no enemy would have anchored in such a position as the Yellow Squadron did that night, and this fact alone robbed the attack of any air of reality. Next day the manœuvres terminated, the ships proceeding to Wilhelmshaven, where they dispersed; Admiral von Knorr striking his flag from the "Blücher" and returning to Berlin.

As in previous years, so in this, the want of cruisers was much felt; while scouting, however, such cruisers as there were employed successfully the curve of search, which was well carried out, touch being obtained with the enemy during the night. The passage of the whole fleet through the Kaiser-Wilhelm Canal in 18 hours, once more proved its great strategical value to the German Fleet. The torpedo-boats seem to have shown themselves powerless to prevent a blockade of the coast, and on the whole, however useful the manœuvres have been for the training of officers and men, no new lessons have been learnt, while the present weakness of the German Fleet has been once more demonstrated.—*Précis from the Neue Preussische Kreuz-Zeitung.*

JAPAN.—*The New First-class Armoured Cruiser "Asama."*—The belted cruiser "Asama" left the Tyne on 7th February, and after running a short time at easy speed with only four boilers in use, she anchored in about twenty fathoms of water, four miles off the coast, in order to test the working of those anchors and cables which had not been used during her recent trip to dock at Chatham. The gear worked satisfactorily. On the 8th inst. the weather was hazy over the land, and the towers marking the measured course were obscured, but the cruiser ran to sea for six hours

at full power of natural draught, with open stokeholds. The H.P. developed was rather over 13,000, giving 140 to 142 revolutions per minute, and a speed by log averaging 20·37 knots. The forced-draught trials were delayed by thick weather and strong winds till the 11th, when, with a moderate sea but a strong beam wind off the land, the engines worked up to 19,000-H.P., with 158 revolutions and a mean speed for the vessel of 22·07 knots. The engines, manufactured by Messrs. Humphreys and Tennant, worked absolutely smoothly.

The "Asama" is the twelfth vessel the Japanese possess which was built at Elswick, but these were not all purchased. There are many points in her of considerable interest. Both engines are supplied with steam from cylindrical boilers placed back to back and stoked from the wings, and they give 13,000-H.P. without forced draught and 18,000 with 2 inches of air pressure. The guaranteed speeds are 20 knots at the lower and 21¼ at the higher power, but these speeds were exceeded in practice. The boilers are worked at 150 lbs. pressure, and a comparatively short stroke is arranged so as to keep the whole of the cylinders below the armoured deck, which is 2 inches thick, and extends to the ends of the ship. This deck is flat at the top, and bends downwards on either side to meet the lower edge of the belt, the employment of sloping glacis at the engine-room openings being thus avoided. The propellers work outwards, and vibration is small at all speeds. The high and intermediate cranks are set at an angle of 170°, the two low-pressure cylinder pistons having cranks at the same angle, one from the other, but the general line of the latter is at right angles to the general line of the high and intermediate cranks. The vessel's coal stowage is 700 tons normal, and 1,450 tons can be carried all in bunkers, and this larger quantity may be considerably increased by temporary means without impairing the sea-going qualities of the vessel. In addition to the ordinary ash-discharging lifts, the "Asama" is fitted with Shee's ejectors, which allow the refuse from the furnaces to be forcibly ejected through the side by water-jets. That the form of the hull is admirable is shown by the absence of wave-making at even the highest speeds, and by the rapidity with which the vessel answers her helm.

The cruiser is a formidable fighting-ship from every point of view—speed, sea-going quality, offensive armament, defensive armour, and turning power. Her armament includes four 8-inch Q.F. guns, mounted by pairs, one pair forward and one aft, in gun-houses of 6-inch Harveyized steel, with an inner skin of an additional inch, and a flat cover 1 inch thick, with three sighting cowls rising about 1 foot above the cover. The ammunition lifts open directly into the turrets. The guns in the forward turret are 25 feet above the water-line, and the after guns 24 feet. There are fourteen 6-inch Q.F. guns, disposed as follows: Ten are in casemates of 6-inch Harveyized steel, two on either side forward and two on either side aft, in pairs over one another, with one more gun on either side of the main deck, each in an isolated casemate. The remaining four are behind shields, as upper-deck mountings. The lower tier of sponsoned guns is 12½ feet above the water-line, the upper about 20 feet. In addition to the above, twelve 12-pounders and seven 1½-pounders, available for boat or land service, are in various parts of the ship. During the gun trials both pairs of 8-inch guns were fired directly either ahead or astern with 5° elevation, and no injury was done. The four 6-inch guns forward were fired simultaneously, and also those aft, the boats, woodwork, and other fittings of the vessel being uninjured. All guns were fired with full charges.

The defensive armour, including the armoured decks, is stated to weigh 2,100 tons, and is thus disposed: A belt of 7-inch Harveyized steel, 7 feet deep, is along the water-line, 2 feet above it and 5 feet below; this belt tapers to 3½ inches at the ends of the vessel. Above the 7-inch belt is another of 5 inches thickness, which reaches beyond the turrets at either end, and is then bent inwards and across, forming complete athwartship bulkheads, protecting the bases of the turrets and generally shielding the vessel against raking projectiles; a belt of 6-inch plating

which extends 25 feet aft from the stem on either side protects the bow torpedo-tube. The "Asama" is supplied with four under-water torpedo-tubes in addition to the one above water forward, and all are intended for torpedoes of 18-inch calibre. The main deck is in two thicknesses, each of ½-inch steel, and the ammunition lifts where they rise above the belts are circular tubes of 3-inch steel. The upper deck is covered with teak, and this is practically the only woodwork that cannot be disposed of in case of action or fire. The fire-main is completely under the armoured deck, and has risers at intervals, each with its own valve, so the accident which occurred in the Spanish ships at Santiago from the destruction of their fire-mains is guarded against. The bulkheads are of steel, and the doors and cabin fittings alone are of wood. A flat 2-inch steel plate runs horizontally forward to strengthen the lower portion of the ram, whose upper side is adequately strong from the support afforded by the continuance of the armoured deck right up to the stem. The ram is hollow, and is not stuffed with cork in small pieces, as is the case in many vessels of many nations, the British included. There is an armoured look-out with 14-inch sides at the forebridge and another aft. The "Asama" has two funnels fore and aft, two masts with fighting tops, and in general appearance resembles the "Canopus" class. The accommodation for officers and men is good, and the head-room, nearly 7 feet under the beams, is somewhat better than in the general run of Her Majesty's ships. Her length is 408 feet, with 67 feet beam, and she has a displacement of 9,750 tons at a mean draught of 24 feet 8 inches, with the normal supply of coal (1,300 tons) on board. At this draught it takes 40 tons to sink her 1 inch.

The Japanese Navy has become a strong factor in the politics of the East, and the Armstrong firm have now in hand four more high-class ships for that Navy, and others are being constructed in France, in Germany, on the Thames, and at Clydebank. The "Azuma" at St. Nazaire is longer, narrower, deeper, of somewhat smaller displacement, and rather less heavily armed than the Elswick "Asama." The "Yazumo" at Stettin is approximately of the same length as the "Asama," but 2 feet 9 inches narrower, a little shallower, with a larger displacement; hence it may be presumed that her middle body is continued further forward and aft, and if that is the case there may be some difficulty in driving her at the required speed. The trials of these two vessels will be watched in this country with great interest.—*Times.*

UNITED STATES.—*Naval Ordnance.—Report of Commodore O'Neil.*—From the report of the Chief of the Bureau of Ordnance, which is very full, we take the following:—

Estimates.

Fuel, tools, material and labour, maintenance of proving ground, for target practice, reserve supply of ammunition, conversion of 6-inch guns to rapid-fire, purchase and manufacture of smokeless powder, machinery for gun plant	$1,875,000.00
Reserve guns for auxiliary cruisers	250,000.00
Continuing smokeless-powder factory	25,000.00
General expenses of the torpedo station	65,000.00
Fitting Fort Lafayette for magazine purposes	5,000.00
General repairs to buildings, magazines, etc.	30,000.00
Naval Militia	60,000.00
Contingent, freight, etc.	15,000.00
Civil establishment at Navy Yards	32,858.50
Machinery for new ordnance building at League Island	60,000.00
Additional and, etc., for magazine near Norfolk	27,500.00
Steam ligh er for League Island Navy Yard	30,000.00
Towards armament and armour for vessels authorised	4,000,000.00
Total	$6,475,358.50

The following table shows the present state of main-battery guns whose construction has thus far been authorised, and their general assignment :—

Breech-loading Rifles.

Class.	Number of guns completed.	Total guns ordered.	In new Navy.
13-inch, 35 calibre	29	34	32
12-inch, 35 calibre	14	14	12
10-inch, 30 calibre	24	24	16
10-inch, 35 calibre	2	2	2
8-inch, 30 calibre	9	9	9
8-inch, 35 calibre	65	72	63
8-inch, 40 calibre	2	2	2
6-inch, 30 calibre	123	123	148
6-inch, 35 calibre	6	6	148
6-inch, 40 calibre	43	68	148
5-inch, 30 calibre	2	2	2
5-inch, 40 calibre	171	197	125
4-inch, 40 calibre	130	211	133
4-inch, 50 calibre	—	26	—
Total	620	790	840

Four 10-inch, 30-calibre, lost on the "Maine." Two 6-inch, 30-calibre, lost on the "Maine."

Of gun carriages, 731 are required, 608 have been completed, and 80 are partly completed.

Since the date of last report, 112 guns of various calibres from 4 to 13-inch have been completed at the Naval Gun Factory, viz. :—Sixteen 4-inch, fifty-four 5-inch, twenty-nine 6-inch, one 12-inch and twelve 13-inch ; while thirty-three 6-inch and two 8-inch guns of ordinary type have been converted into Q.F. guns. Thirty-seven 4-inch guns and mounts under contract with private firms have also been partly completed. Forgings have been ordered for five 8-inch, twenty 5-inch, twenty-six 4-inch, and one 3-inch (14-pounder) guns. While no material change has been made during the year in the general system of construction of guns under manufacture, new designs have been prepared for future guns of all calibres, calculated to ensure a much greater muzzle energy than is now obtained from guns of the same calibre at present in service. The first of these new guns will be installed on board the battle-ships "Maine," "Ohio," and "Missouri," and on board of the four harbour-defence monitors authorised at the last session of Congress.

The guns and mounts and their appurtenances in service have been severely tested during the recent war, and it is gratifying to be able to report that their performance has been in general thoroughly satisfactory. Some minor defects in the details of some of the mounts for guns of small calibre developed, and were quickly, or are being, corrected.

Tables given with the report show that in the main batteries of fifty-five vessels of the Navy 564 guns, from 4 to 13-inch, have been placed, and the secondary batteries of these vessels number 857 guns. In thirty-six vessels that carry only secondary batteries there are 166 guns. One hundred and seven vessels that were purchased, chartered, or turned over to the Navy by other departments were armed with 576 guns. In all, we had on board ship during the war 2,163 guns. Some, like the "Hartford," "Pensacola," etc., were not in service.

Fourteen vessels of the Regular Navy were equipped, making a total of 121 vessels furnished with batteries during the year.

Improvements in Armament.—The battery for the "Atlanta," consisting of two 8-inch and six 6-inch converted rifles, mounted on new and improved mounts, has been practically completed. Four new 8-inch guns and mounts for the "Chicago"

are in process of manufacture and well advanced. The "Newark" and "Yorktown" have each received batteries of 6-inch converted rifles in place of their former guns, and the "Oregon" has received four 6-inch 40-calibre rapid-firing guns in place of her 30-calibre breech-loading guns. The arrangements for facilitating the loading of the 12-inch guns of the "Texas," designed by Lieutenant Haeseler, U.S.N., were completed and installed in the vessel and proved an unqualified success, reducing the time required for loading from eight to less than two minutes, thus greatly increasing the efficiency of this vessel. This change was authorised upon condition that the vessel should be ready for service at any time within forty-eight hours' notice, and the work was so well arranged and executed that these conditions were fulfilled.

New elevating gear of an improved type has been supplied to the 8-inch turret guns of the "Brooklyn" and "Iowa." The type mount for the 13-inch guns of battle-ships Nos. 5, 6, 7, 8, and 9 has been completed, tested, and shown to be entirely satisfactory, being automatic in its action and not requiring any auxiliary power to operate. New types of mounts for 6-inch and for 4-inch rapid-firing guns have been designed, and one of the latter is being manufactured for a new high-power 50-calibre 4-inch gun.

A new type of rammer, intended for turret vessels, having hydraulic power, has been designed and designated as the hydro-pneumatic rammer. It is much simpler than the old type of hydraulic rammer, and much stronger. Four have been supplied to the "Oregon," four to the "Texas," and others are in process of manufacture to replace the old types of hydraulic rammers in service. New vessels will be supplied with a simple form of telescopic rammers capable of being operated by hand or by electric power.

The use of electric power for turning turrets, hoisting ammunition, and operating gun-working machinery, which the Bureau has strongly advocated for some years past, has demonstrated its superiority over any other kind of power for these purposes, and the Department is to be congratulated upon its action in designating its use, in ships now building and to be built, to the extent it has. A simple expansion of the electric plant is sufficient to furnish the requisite power, and the facility of running cables, as compared with steam, pneumatic, or hydraulic pipes, the absence of heat, which causes so much discomfort in modern vessels, while the perfection of control and ease of manipulation of which it is susceptible render the electric system immeasurably preferable to any other which depends upon long leads of pipes under high pressure, with numerous packed pistons, valves, and joints.

Experience has shown that guns in turrets operated by electric power can be more accurately laid upon and made to follow a moving target than when operated by steam, hydraulic, or pneumatic power. There are no water pipes to freeze, no steam pipes to burst, and no delay in obtaining a full working pressure, and no troublesome or noisy exhaust pipes to deal with. A burnt-out fuse can be quickly replaced or a broken wire repaired, and as the wires can be led below the armoured deck, there is little liability of the latter becoming necessary. It is true that intelligence, skill, and watchful attention are necessary to care for and to ensure the proper working of the elaborate auxiliary machinery and numerous mechanical appliances now installed in modern vessels, but there seems to be no difficulty in this respect. Officers and men readily adapt themselves to new conditions, no matter how novel or intricate their character, and it is a well-known fact that seamen gunners trained at the Naval Gun Factory and at the torpedo station are eagerly sought for by commercial houses on account of their proficiency, and often give up the service to accept the higher pay offered.

Hang-fires and Failure of Base Fuses.—All guns of and above 4 inches in calibre are now fitted with attachments for using either electric or percussion primers, but on account of the additional elaboration necessary for this purpose the Bureau intends to use percussion ammunition only in

guns of and below 5 inches in calibre. While electric firing is preferable, the means of producing it are more elaborate, and any fault is more difficult to locate than is the case with percussion firing. Results vary very much, however, in different vessels having similar outfits, due, unquestionably, to the difference in the amount of care bestowed. When smokeless powder was first introduced for minor calibre guns using fixed ammunition, some difficulty was experienced on account of hang-fires. This has been entirely overcome by the use of a specially designed long primer. Several instances were reported to the Bureau of failure to explode of shells fitted with base percussion fuses, even after striking masonry or other mediums offering considerable resistance, in consequence of which all fuses of this character will be made much more sensitive hereafter, without, however, rendering them less safe to handle or transport. The adjustable combination time and percussion fuses now in service are accurate and reliable. The Bureau is now carrying on experiments with a new form of base fuse, which does not contain a fulminate cap.

Sights.—All new guns of and above 4 inches in calibre are fitted with telescopic sights, and in addition an auxiliary horizontal bar sight is supplied to ship in place of the telescope in case of accident to the latter. As the weakest part of a turret is its sighting hood, in which has hitherto been located the only means of sighting the turret guns, the Bureau has decided to attach to all turret guns a bar sight to be used through a slit in the armour, in addition to the telescope in the sighting hood. A 6-inch projectile at moderate range would probably destroy any sighting hood if fairly struck, and, while the turret and guns might still be intact, the means of sighting would be gone.

Automatic Guns.—The Bureau has in process of manufacture at the Naval Gun Factory 100 heavy 1-pounder automatic guns, nearly half of which are practically completed. These guns fire at the rate of 250 shots per minute, but are nearly as heavy and as large as a 6-pounder, and have the disadvantage of using their ammunition from belts, which is always a source of more or less trouble. The Bureau does not consider the 1-pounder guns as of any appreciable value in the economy of a battle-ship or large cruiser, except, perhaps, for boat guns, and will substitute for them on the torpedo-boats about to be built the 3-pounder semi-automatic guns. When automatic guns work well they are ideal, but when anything goes wrong the difficulty cannot be quickly remedied as a rule. The Bureau is also making sixty-five semi-automatic 6-pounder guns at the Naval Gun Factory, intended for the new torpedo-boat destroyers, which will carry in addition to five such guns two 12-pounders each. A 6-pounder semi-automatic gun of the kind above referred to was recently fired 1,000 rounds at the proving ground without hitch or the failure of any part of the mechanism, and probably might be fired many more times.

New 3 and 6-inch Q.F. Guns.—A new high-powered 3-inch gun (14-pounder) has been designed, calculated to have a muzzle velocity of 3,000 foot-seconds, and the forgings for the type gun have been ordered. A new mount is also being made for this gun.

Several years ago when the Bureau began the manufacture of rapid-firing guns, it had two 6-inch guns made with the ordinary obturator and quick-working breech mechanism operated by a lever, which worked admirably, but as brown powder alone was then in vogue, it was considered necessary to use a brass case to contain the charge to prevent fouling of the powder chamber, and in order that sponging the gun might be dispensed with; hence the general adoption of the brass cartridge case for all rapid-firing guns. The advent of smokeless powder has changed the conditions, and fouling of the bore and sponging are no longer factors in the case, and the Bureau has recently designed, built, and tested a 6-inch rapid-firing gun that does not require a brass cartridge case; and this will be a feature of all 6-inch rapid-firing guns hereafter. In smaller calibres, where the ammunition is complete and handled as a whole—that is, where the projectile

is inserted in the case—the brass cases will be retained to facilitate rapidity of loading. The new type of 6-inch gun is 45 calibres in length and weighs 8 tons, and is designed for a muzzle velocity of 3,000 foot-seconds.

Turret Guns.—While heavy guns in turrets must be regarded as one of the chief characteristics of modern battle-ships, the lessons of the day indicate that the greatest execution (except against the heaviest armour) may be expected from a number of Q.F. guns of smaller calibre mounted separately in armoured casemates, or in a redoubt. The larger and heavier the gun the greater the sacrifice of space and weight to accommodate and protect it and its appurtenances, and the slower and less accurate its fire, owing to the time required to load and to its lack of mobility. Turrets, while affording the best form of gun protection and the most extended arc of train to the gun, afford no protection to the hull; the spaces within them are necessarily contracted; the field of view from the sighting hood is limited; the heat is intense in warm climates; the ventilation imperfect, even when electric forces are used, and the machinery necessary to operate them is elaborate.

Notwithstanding these drawbacks, heavy guns in turrets must be recognised as a necessity, but the question as to the maximum calibre to be employed is a subject for serious consideration, and one upon which the Bureau has bestowed much thought. Heretofore the 13-inch rifle of 60½ tons weight, 35 calibres in length, having a muzzle velocity of 2,400 foot-seconds, with smokeless powder, and a capacity to penetrate with a capped projectile 19 inches of face-hardened armour at a distance of 2,500 yards, has been regarded as the best type for the heavy turret guns of our first-class battle-ships, and all heretofore built (excepting the "Iowa," which has 12-inch guns) have been equipped with guns of this class. Development of the 12-inch gun has been so great and its power so much increased that the Bureau is of the opinion that hereafter it will be the maximum calibre; that it will be advisable to install them on future battle-ships, and that these should be supplemented by an auxiliary battery of 6-inch Q.F. guns in casemates, with a secondary battery of 6-pounders and 12-pounders. The reduction in weight of the 12-inch gun alone is not great, being but 7½ tons less than is that of the present 13-inch gun; but the reduction in the size of and consequently in the weight of the turrets, barbettes, and ammunition is very great.

The thickness of armour hereafter to be used is also under consideration. Heretofore our battle-ships have carried very heavy belt, diagonal, turret, and barbette armour, more so than now appears necessary or desirable, in consideration of the improvements recently made in the quality of armour, and of the necessity of distributing protection over a greater area of vessels' sides than has heretofore been the practice. The Bureau is therefore of the opinion that 12 inches is the maximum thickness of armour that will hereafter be required.

Smokeless Powder.—After many difficulties the manufacture of a purely smokeless powder, made by the Bureau's formula from soluble nitrocellulose dissolved in ether alcohol, uniform in character, and possessing good keeping qualities, has become an accomplished fact. Considerable quantities have already been provided and a few vessels have been given complete outfits; all vessels fitted out hereafter will, if time and money permit, be supplied exclusively with smokeless powder, except a certain number of charges of brown powder to be used for target practice, in order that the supply of the latter on hand may be used up, and because it is cheaper than smokeless powder. The Bureau could have supplied considerable quantities of smokeless powder to various vessels during the late war, but, as owing to lack of time it was impracticable to supply complete outfits, it seemed useless to supply it in part, as a few guns using brown powder would nullify the advantages gained by the use of smokeless powder in others. The Bureau has now in process of manufacture a large quantity, and will endeavour to accumulate a sufficient supply to gradually introduce it into all vessels in the Service.

Congress at its last session having appropriated a sum of money for the erection of a Government factory for the manufacture of smokeless powder, a parcel of land on the Indian Head Reservation has been cleared for the purpose. The land is well situated on Mattawoman Creek, an estuary of the Potomac, being quite remote from any populous districts, and can be approached by land or by water.

Torpedoes and Torpedo Material.—Since the date of the last report a contract has been concluded for fifty short Mark III. Whitehead torpedoes, fitted with Obry gears, and for twenty-five long Mark I. Whitehead torpedoes, also fitted with Obry gears.

Some experiments with the Cunningham rocket torpedo, carried on by the inventors, were witnessed by a board of officers from the torpedo station. These experiments resulted in complete failure. Three of the torpedoes, weighing about 930 lbs. each, were successfully launched from an under-water tube rigged in the bow of a schooner, but their performance was most erratic. The fourth exploded within the tube, wrecking and sinking the schooner. Fortunately no person was injured.

In the future no more torpedo-tubes will be placed on board the unarmoured cruisers, and in the case of armoured cruisers and battle-ships under-water discharge-tubes alone will be installed.

A design of under-water tube has been adopted for use in the new battle-ships, and preliminary work has already begun at the Naval Gun Factory for the manufacture of the requisite number.

Armour.—The total weight of armour required for the "Alabama," "Illinois," and "Wisconsin" has been divided equally, as nearly as practicable, between the two only armour manufacturers in this country, each making the entire armour for one ship and that for the third being divided between the two.

All the armour for the "Kearsarge" and "Kentucky" has been delivered, with the exception of the shutter-plates, which cannot be machine finished until all other plates are in place, which depends on the progress made by the ship-builders. The armour for the "Alabama," "Illinois," and "Wisconsin" is advanced far beyond the requirements of the contract, and deliveries will begin much in advance of the stipulated time. Of armour there has been delivered, during the year, for the "Kearsarge," 1,057 tons; for the "Kentucky," 1,040 tons; for the "Illinois," "Alabama," and "Wisconsin" (each 35 tons), 105 tons; this latter being the diagonal for these ships, and was furnished by the ship contractors last winter at the then allowed legal rate of $300 per ton. The armour now under contract for each of these three latter ships is 2,559 tons. No armour has yet been contracted for for the battle-ships "Maine," "Missouri," and "Ohio," nor for the four harbour-defence monitors authorised by the last Congress.

Considerable improvement has been made in the method of face-hardening armour, as applied to experimental plates, and the Bureau has tested one of 6 inches in thickness, and another $11\frac{3}{4}$ inches in thickness, submitted by the manufacturers, both of which showed excellent qualities somewhat in excess of plates previously presented which had been treated by other processes. There is but little doubt that armour of superior quality to that previously used can be manufactured, resulting in a considerable saving of weight which now has to be assigned for protection in armoured vessels.

The armour factory Board, appointed by the Department since the date of the Bureau's last report, has submitted an exhaustive report on the subject of manufacturing armour, with a view to the establishment of a Government factory, but no further steps have been taken looking toward the erection of such a factory.—*Army and Navy Journal.*

MILITARY NOTES.

PRINCIPAL APPOINTMENTS AND PROMOTIONS DURING JANUARY, 1899.

Lieut.-Colonel A. M. Paterson, from Deputy Assistant Adjutant-General to command the 102nd Regimental District; Lieut.-General Sir R. C. Low, G.C.B., to be Lieut.-General on the Staff in India; Lieut.-General Sir A. P. Palmer, K.C.B., Indian Staff Corps, to be Lieut.-General on the Staff in India; Major-General Sir G. B. Wolseley, K.C.B., to be Lieut.-General on the Staff in India, and to have the local rank of Lieut.-General whilst so employed; Major-General Sir G. Luck, K.C.B., to be Lieut.-General on the Staff in India, and to have the local rank of Lieut.-General whilst so employed; Major-General G. de C. Morton, C.B., from Adjutant-General in India, to command a 1st Class District in India; Colonel Sir W. G. Nicholson, from Deputy Adjutant-General in India, to be Adjutant-General, with temporary rank of Major-General; Colonel W. L. Anderson, Madras Infantry, to be Major-General; Colonel J. G. R. D. MacNeill, C.B., Madras Infantry, to be Major-General; Surgeon-General W. Taylor, M.D., C.B., to be Deputy Director-General; Lieut.-Colonel W. L. Gubbins, M.B., R.A.M. Corps, to be Assistant Director; Lieut.-General N. Stevenson, to be General; Major-General J. Fryer, C.B., to be Lieut.-General; Colonel R. B. Lane, C.B., commanding troops, Alexandria, to be Major-General; Colonel J. D. P. French, to be Major-General on the Staff to command the Cavalry Brigade at Aldershot; Brevet Colonel M. C. B. F. Forestier-Walker, to be Assistant Adjutant-General, with substantive rank of Colonel in the Army; Lieut.-Colonel R. B. McComb, A.S. Corps, to be Deputy Assistant Adjutant-General; Lieut.-Colonel L. E. B. Booth, to be Deputy Assistant Adjutant-General; Brevet Colonel J. R. J. Jocelyn, to be Commandant Artillery College, with substantive rank of Colonel in the Army; Lieut.-General G. Clerk, C.B., Lieutenant of the Tower of London, to be General; Major-General E. Hopton, C.B., to be Lieut.-General; Colonel J. E. Boyes, to be Major-General; Surgeon-General J. A. Woolfryes, M.D., C.B., C.M.G., late Medical Department, to be Hon. Physician to the Queen; Brevet Colonel J. H. A. Spyer, to command 18th Regimental District; Lieut.-Colonel the Hon. E. Noel, to be Deputy Assistant Adjutant-General; Lieut.-General G. N. Channer, V.C., C.B., to be General; Major-General F. Lance, C.B., to be Lieut.-General; Colonel C. A. Cuningham, to be Major-General.

HOME.—Major J. Battersby, R.A.M.C., lately read a paper before the Röntgen Society, Mr. C. W. Mansell-Moullin, M.D., F.R.C.S., presiding, on "The Present Position of the Röntgen Rays in Military Surgery." Major Battersby's paper was based on his experience in the Soudan campaign with a modification of Mr. Mackenzie Davidson's apparatus. The results of his work appear to have been eminently successful, as he claims to have localised some deep-seated bullets with mathematical accuracy, and to have rendered their extraction simple and easy. In the course of his paper, Major Battersby said that most of our large military hospitals, at home and abroad, were now provided with a most efficient X ray outfit, and every inducement and encouragement were offered to officers by the Director-General of the Army Medical Service to acquire a thoroughly practical knowledge of the process. Much doubt formerly existed as to whether it was applicable for field service. Surgeon-Major Beevor, however, had demonstrated that successful results could be obtained in the cold and mountainous regions of Northern India. More recently, Major Battersby himself was selected for service in charge of the Röntgen ray apparatus in the Soudan, where the temperature varied from 100° to 122° Fahr. in the shade. He said that whatever success attended his labours in the Soudan was largely due

to the great care and attention bestowed upon the construction of the coils before they left London, and also to the ready and able assistance he obtained from the warrant officer of his own corps, who was selected to help him. Nowhere had skiagraphy proved of greater practical value than in the detection and localisation of foreign bodies. After giving interesting details of the work, the lecturer remarked that probing for an uncertain bullet, with its subsequent pain, was now a thing of the past in military surgery. Bullets could now be localised with mathematical precision in the deeper parts of the body on field service, while great help was afforded by the aid of the rays in uncertain fractures.

The following letter written by an officer who served in the late Khartoum expedition is of special interest, as showing the effects of the bullets used at the battles of the Atbara and Omdurman :—

"With regard to the wounds caused at the Atbara, I personally can say very little; I was so busy attending to our own wounded, there was no time to look after the Dervishes. The bullet used was the old Lee-Metford with the tip filed off, so as to expose the lead, but I don't suppose they are ever likely to be used again, and my experience is that they were not altogether a success, for this reason, viz., if they were filed off enough to make them 'set up,' they stripped in the rifle.

"The bullet used at Omdurman was a hollow-nosed bullet, and the conclusions I came to, after examining a large number of wounded, were :—

"1. Provided the projectile only passes through soft tissues (such as the calf of the leg) where it meets with but little resistance, it passes clean through, and the wound caused is a trivial one, the wounds of entry and exit being the same size.

"2. Where it meets with sufficient resistance to cause it to 'set up' but not to arrest its progress in the body or limb, the entrance wound is small but that of exit *very large*, and there is great damage of the surrounding tissues.

"3. When it meets with sufficient resistance to arrest its progress altogether, the wounds caused are very severe, shattering all the surrounding tissues. I don't think there can be any question of the stopping powers of the hollow-nosed bullet, and it seems to 'set up' very easily; but it must be borne in mind that the wounds were all caused at long ranges, perhaps there were a few at 600 yards, but the majority must have been at nearly double that distance, so that there was no opportunity of observing the effect at short ranges."

The returns of the thirty-eight regiments of Yeomanry cavalry for last year have been issued. They show that the total enrolled strength is 10,207, an increase of 16 over the strength in 1897, and that 8,914 were present at training, an increase of 85. Of the 1,293 absent (decrease 69), 1,020 (decrease 63) had leave, and 273 (decrease 6) were without leave. The full establishment (11,891) was the same in both years and 1,684 are wanting to complete the total. The number of horses at training (8,719) is less than in 1897, and the number actually owned by the Yeomen has decreased; those hired or lent by relatives or friends have increased. The regiments producing the largest numbers at training were: The Bucks, 359; Cheshire, 358; Yorkshire Hussars, 342; Gloucestershire, 341; Leicestershire, 335; Ayrshire, 334; Southern Notts, 318; and Royal North Devon, 310.

A patent bivouac valise, the invention of Lieut.-Colonel J. Y. Myrtle, 1st Midlothian Volunteer Artillery, was exhibited at the Royal United Service Institution, after the lecture by Major May, R.H.A., on the 13th February.

It is rot-proof, waterproof, and of durable material, and holds all that is necessary for a soldier's spare kit in a pillow valise. When folded it makes up into a neat roll contained in an outer cover, 16 inches by 7 inches. The weight of the bivouac valise, without the "spare kit," is under 3½ lbs.; unrolled for bivouac

it is 9 feet long, with 58 inches capacity. The whole valise, when folded up, may remain in store for many years, and will come out as serviceable and good as the day that it was put in, and when opened out will be unspoilt at the folds. This cannot be said of any rubber system of proofing. The advantages claimed for it are that a field army supplied with it would have a great superiority over the enemy not similarly supplied, in that a minimum number of men would be disabled in the campaign from climatic causes, and the doctor's duties would be lightened. It would lighten transport; the cape, which is at present carried in the regulation valise, might be dispensed with, which would counter-balance the slight extra weight of the bivouac valise, and would render the transport of blankets and waterproof sheets for the men by the regimental transport unnecessary. Every man would stand in the ranks complete in himself, and independent of transport, except for food and spare ammunition. This would increase the mobility of a field army and the mobility of its mounted troops and cyclists.

The adjustment of the valise in bivouac is left to the soldier (no sticks being carried for this purpose), and he would simply cut two short pegs to fasten down the free head covering in wet stormy weather, or two larger sticks in clear warm weather to erect the free head covering into an awning over his head and chest, with the sides of it hanging down. The soldier could soon make himself comfortable in it under all circumstances. The pillow valise, holding his spare kit, would be placed under his head; and he can get into the bivouac valise with his boots and great-coat on if desirable. Finally, the valise is easily and quickly rolled up for the march.

The Secretary of State for War has decided that, until further orders, the following rules shall be observed regarding the voluntary retirement of officers of the cavalry and infantry, other than officers of the Household troops and of the West India Regiment:—

Voluntary retirement on retired pay or gratuity from the regimental rank of major on full pay will not be allowed before the completion of 25 years' service, except when the officer is desirous of retiring is appointed to serve five years in the Militia under the conditions laid down below, or when, in consequence of the retirement:—A supernumerary major or captain would be absorbed; a major from the half-pay list would be appointed to full pay; a captain of cavalry or infantry of the Line with at least 18 years' service would be promoted; a captain who is within two years of the age fixed for his compulsory retirement would be promoted; or a captain would be promoted who, in the opinion of the Commander-in-Chief and the Secretary of State, has performed exceptionally good service.

Voluntary retirement on retired pay or gratuity from the regimental rank of captain on full pay will not be allowed, except when the officer desirous of retiring is appointed to serve for five years in the Militia, or when the vacancy would be filled:—By the absorption of a supernumerary captain; by the appointment to full pay of a captain from the half-pay list; by the promotion of a lieutenant of cavalry or infantry of the Line who shall have completed at least nine years' service; or by the promotion of a lieutenant who shall in the opinion of the Commander-in-Chief and the Secretary of State, have performed exceptionally good service.

In the case of an officer appointed, on his retirement from the Regular forces with retired pay, to serve for five years in the Militia, such retired pay will not be issued for any year in which he does not attend the annual training of his Militia battalion, except when he is excused from such attendance on account of illness duly certified by the regulated medical authority, or for such other reasons as may be deemed sufficient by the Secretary of State. In the case of an officer retiring as above with a gratuity a deduction of £250 will be made from the gratuity, to be issued at the rate of £50 a year for each year in which he trains with his Militia battalion, except when he is excused from such attendance on account of duly certified illness, or for such other reasons as may be deemed sufficient by

the Secretary of State. For years in which he does not train, or is not so excused, the £50 will be forfeited. Officers joining the Militia will take rank according to their original date of appointment in their rank.

INDIA.—During the cavalry manœuvres in India experiments are to be tried with a view to enabling horse artillery to keep up with cavalry when operating in the field. With this view the horse artillery will cease to carry spare wheels and the axle-tree seat will be abolished.

According to Indian Army Orders, all leave out of India under British rules taken by non-continuous service Royal Engineer officers will in future count as regards pay as leave taken under the rules for the Indian Staff Corps. The Order has retrospective effect to March 31st, 1898.

The authority for raising a new Goorkha Mountain Battery has appeared in Army Orders in India. The battery is to be for general service, and is to consist of six guns, with the same equipment as other mountain batteries. It is to be recruited from "Limbos" and "Rais," the former being a much taller man than the ordinary Goorkha found in most Goorkha regiments. The new battery will be No. 9 (Goorkha) Mountain Battery. The terms "First-class Gunner" and "Second-class Gunner" are substituted for those of "Gunner" and "Driver."

At the close of the recent Meerut rifle meeting some very interesting experiments were conducted, under the superintendence of Colonel Hill, to ascertain the effect of the Lee-Metford and Martini-Henry bullets fired at 100 yards at full boxes of Lee-Metford cordite and Martini-Henry ammunition. The results clearly proved that a full box of Lee-Metford cordite ammunition is absolutely bullet-proof against Lee-Metford or Martini-Henry bullets fired at 100 yards; that the Lee-Metford bullet only penetrates three packets of ammunition and lodges in the fourth; that the boxes of Lee-Metford cordite ammunition do not explode, the cordite having only burned when penetrated. Consequently, a breastwork of single boxes of Lee-Metford cordite ammunition, placed one on the top of another, affords ample protection against rifle fire. Secondly, the results proved that boxes of Martini-Henry ammunition with black powder are bullet-proof, but are liable to explode, the contents being scattered in all directions within a radius of 15 or 20 paces.

AUSTRIA-HUNGARY.—A sum of 17,260,891 gulden has been demanded for the management of the Administration of the National Defence for the year 1899; this is 877,270 gulden more than has been granted for any previous year. The increase demanded is to be expended in the following manner, viz. :—In the raising of five new battalions, as many Landsturm district commands, and two Landwehr infantry brigade commands; in the increase of superintending officials in the staff and higher commands; in a standing increase in the Landwehr cavalry of 39 subaltern officers and officers' servants, 39 officers and 7 troop chargers; in the Landwehr Cadet School of 5 superintending officers, and in the cavalry detachment of this school, of 1 officer, 1 non-commissioned officer, 6 uhlans, 1 officer's and 11 troop chargers, in order to be able to perfect more pupils in cavalry training. In Wels there will be two concurrent classes established for the purpose of ensuring the uniform, practical, and theoretical training of officers and cadets.—*Militär-Wochenblatt.*

From the commencement of the year 1898 up to November last, the transfer of officers from the Imperial Army to the "Honved" has taken place on 63 occasions, viz. :—1 colonel, 29 captains of the first class, 5 captains of the second class, 27 first lieutenants, and 1 lieutenant. The Minister of National Defence was interrogated by the Defence Committee of the Hungarian Reichstag, whether such a proceeding might not be prejudicial to the claims for promotion of officers of the "Honved" in a manner that might not easily be rectified, and replied that if such precautions were not taken, the officers of the Landwehr would very soon out-

strip for promotion those of the Regular Army; it was, however, a problem of the highest possible consideration to so manage that both constituent parts of the defence force should be equally developed. By the steps now taken, the Minister continued, a lieutenant would remain in his rank from about four to five years, a first lieutenant about seven, a captain an average of ten, a major four, a lieut.-colonel three-and-a-half, and a colonel five to six years, so that a major-general would have about from 32 to 35 years' service.—*Neue Armee-Zeitung.*

As was reported, this year's Imperial Manœuvres will take place between the 1st and 14th September in the districts of the 8th (Prague) and the 9th (Josephstadt) Army Corps, and that of the 3rd (Graz) and the 14th (Innsbruck) Corps. It is not yet, however, finally decided if manœuvres on a large scale will also take place in Hungary this year.—*Militär-Zeitung.*

BELGIUM.—Three new and most important regulations have been put in force from the 1st January, 1899, viz., the regulation on the new method of clothing, that on the feeding service, and that on the bedding service. The clothing is provided for by the company, the squadron, or the battery. Each unit has its own shop and its own budget. This is the German method slightly modified. Opinions are much divided on the subject of this reform. The feeding service has been settled in the smallest details; it is exclusively guaranteed by the slaughter-houses, by the millers, by the bakeries, by the forage stores, and by the manufactories of Government preserves, and is under the direction of the Commissariat.

A private industry, the "Society for Military Beds," provides the bedding. The State has taken it under its charge to the great benefit of the soldier. The society provides excellent materials for bedding, but the contracts have been too favourable to the society, and the soldier pays enormously.

As to the barracks, their transformation is proceeding rapidly. There are few old barracks left, and the time is at hand when they will have completely disappeared. One will soon be able to state that nowhere is a soldier better housed, better fed, better paid, and better treated than in Belgium.—*Revue Militaire Suisse.*

The Belgian Minister of War has decided to form a cyclist company to each battalion of the carabineers. The fourth companies of the 3rd and 4th Battalions have been detailed for this service, and will include cyclists only in their effective strength. When the regiment of carabineers are able to form a greater number of cyclists and when it has the necessary number of machines, the fourth companies of the 2nd and 1st Battalions will be successively transformed into cyclist companies.

Foreseeing the importance that military cycling would rapidly acquire, the War Department has never ceased to interest itself in this question. Each year they appealed to amateur civilian cyclists to render them some services, of their own free will, which would have the special merit of causing the immense advantages of this mode of locomotion to be properly appreciated. Since 1894, a cyclist section was formed at the regimental school of the carabineers. It was merely intended at first to employ the bicycle as a means of communication, and the section was only used as messengers and orderlies. During the manœuvres of 1896, in the neighbourhood of Huy, General Brassienne formed a squad of combatant cyclists, who, under the command of Lieutenant Béirlaen, demonstrated the great advantages that the bicycle gives for the rapid transport of a company of infantry from one point to another. Shortly afterwards the War Department ordered the formation of a cyclist section to one of the companies of each of the four battalions of the carabineers. These sections had as their object to pave the way for the formation of more important units, in the event of the experimental course proving the advisability of the employment of cyclists as a tactical element.

In 1897 they were able to form, with these four sections, a company of 125 cyclists, which was attached to the 2nd Division of the Army during the manœuvres which took place in the vicinity of Lebbeke, in very difficult country. The results proved most favourable, both from the point of view of the soundness of the folding machine "Belgica" (for which the Government have given a large order), and the utility of cyclists as combatants.

No change has been made in the organisation of the regiment of carabineers, nor in the ordinary military instruction of the cyclist companies. They must perform all garrison duties, and when on foot must wear exactly the same uniform as the other companies. The *rôle* of these companies is to serve as a support to cavalry and to batteries sent a great way off, to relieve the cavalry in taking part in reconnaissances at long distances; to ensure the service of relays between the cavalry and the main body, so as to maintain the effective strength of the horses in the ranks as complete as possible; occasionally to precede the cavalry in order to rapidly occupy an important post, etc.—*Belgique Militaire.*

FRANCE.—*Recruiting Statistics for the year 1897.*—The number of young men of the 1896 class inscribed on the lists for drawing by lot, in January, 1897, amounted to 338,327. By adding those postponed in 1895 (43,540), and in 1894 (23,278), the recruiting resources reach a total of 405,145, which is divided as follows:—

Exempt as unfit for all service...	32,366
Debarred from service	89
Postponed	69,721
With fixed residence abroad	716
Naturalised subjects, exempted by reason of their age from service in the Active Army...	2,007
Enrolled in the Auxiliary Forces, scarcely fit for service and receiving no instruction in peace-time	37,944
Serving as Volunteers { in the Army (*a*)	24,690
Serving as Volunteers { in the Navy	6,000
Drafted into the Colonial Forces	334
Enrolled for 2 and 3 years (*b*)	159,162
,, ,, 1 year (*c*)	72,116
Total	405,145

In the course of the year, 19,002 young men enlisted before reaching the age for military service. By adding them to the numbers mentioned under the headings *a*, *b*, and *c*, one arrives at a total contingent of 274,970 men for the 1897 contingent. It should be observed that the conscripts who failed to appear, viz., those who did not present themselves for drawing lots, or before the Council of Revision, amount to 9,601. These were treated as though they were present, and were drafted into corps.

As a rule these men never joined, and the total number mentioned above should be reduced by that amount.

The men called up and those who enlisted before the age for military service were drafted, in the following proportions, between the various arms:—

——	Called out for 1 year.	Called out for 2 and 3 years.	Those enlisted under age.
Infantry	58,902	105,795	11,294
Cavalry	—	20,920	3,248
Artillery	8,640	22,551	3,803
Engineers	1,220	3,876	657
Military Train	1,220	2,040	—
Administration Troops	2,134	3,980	—
Total	72,116	159,162	19,002

The result of a comparison between the reports on recruiting in Germany and in France is that in the latter country all the men who were passed fit for service were embodied; no surplus whatever remains. The *Gazette de Cologne* observes with regard to this, that the raising of the four new battalions could not take place without weakening existing corps.

In Germany, on the contrary, there remains after a previous deduction of the contingent, a surplus of 9,823 men absolutely fit for service, not counting that, out of the 187,560 young men liable to the 1st Levy of the Landsturm, and assigned to the Recruiting Reserve, about 100,000 could be embodied; 12,500 young men in this second category are, moreover, compelled to a period of twenty weeks' military instruction. If the total number of enrolments is higher in France than in Germany, one should not lose sight of the fact that whereas in France all the recruits not joining are classed as enrolled, and that one-third of those called out only serve for a year; in Germany the recruits not joining are not included in the contingent, and that all recruits serve at least two years.—*Bulletin de la Presse et de la Bibliographie Militaires.*

The French are about to make a slight alteration in the dates at which they incorporate their recruits. Since 1889 the service has been held to begin on 1st November in each year, and the recruits have joined about the 16th of that month. This is thought to be rather late in the year for the commencement of drills, and to place the Army at a disadvantage with regard to others, notably the German. The Minister for War will therefore shortly introduce a Bill to count service from 1st October, and incorporate the recruits at any subsequent date each year, not later than 16th November. The corresponding dates in the chief Continental Armies are as follows:—Commencement of service: Germany, Austria, and Belgium, 1st October; Russia, from 15th October to 15th November; Italy, 1st November. The actual incorporation takes place in Germany early in October for cavalry, and on 15th October for other recruits; on 1st October in Austria; in December for mounted recruits in Italy, and in the spring for the others; and in Russia at the same time as service is held to commence. In Spain soldiers come out in the spring and service counts from 1st March.

La France Militaire publishes the following list of the infantry garrison of Paris, the headquarters of the various regiments, and the barracks they occupy:—

120th	Infantry	Péronne; S. Denis.
124th	,, ...	Dreux; S. Cloud.
128th	,, ...	Abbeville; S. Denis.
129th	,, ...	Lisieux; Mont Valérien.
130th	,, ...	Chartres; École Militaire.
4th	,, ...	Fontainebleau; Reuilly.
36th	,, ...	Falaise; Penthièvre.
39th	,, ...	Bernay; Panthemont.
74th	,, ...	Evreux; Pépinière.
82nd	,, ...	Sens; Nogent.
113th	,, ...	Melun; Tourelles.
131st	,, ...	Coulommiers; Château d'Eau.
115th	,, ...	Alençon; Lourcine.
117th	,, ...	Argentan; Latour Maubourg.

We are now able to give a few details of the new French field gun, in spite of the attempts which have been made to keep it secret. The gun is of nickel-steel, with a calibre of 3 inches, and is on the Deport system, with a screw fermeture; the gun carriage, on the Darmancier system from the works at St. Chamond, has a hydro-pneumatic brake, released by a spring. The recoil is regulated by the

compression of the air and of the spring. Once the trail is anchored to the ground, the gun remains fixed. Two gunners seated on the gun carriage look after its service. The one on the left side handles the breech and does the loading, the one on the right trains and fires the gun. These two gunners are protected on the right and left of the gun by a steel-plate shield, which, according to the St. Chamond formula, should be capable of resisting the full force of a projectile of 15 grammes weight, moving at a velocity of 600 metres (about 1,900 feet).

The gun is supported on a cradle oscillating round a vertical axis. It is susceptible of sufficient lateral movement to allow not only of rectifying the pointing without touching the trail, but during the rapid fire of shrapnel, of regulating ittle by little the pointing of the gun in such a way as to "mow the ground." A single gun can thus "sprinkle" a space of about two acres. The rapidity of the fire, according to French publications, is 15 shots a minute for each gun.

The projectiles are a melinite shell to be used against dead material, such as walls, houses, etc., and, as a common projectile, a steel shrapnel with a charge at the base, containing, according to some, 250 bullets, according to others, 300. On explosion the shrapnel gives out a thick cloud of smoke, which prevents the enemy from seeing or training their guns.

They are unanimous in France in finding the bullets of the shrapnel too small and not efficacious enough at long range. Under 3,000 metres (3,250 yards) there is no question of undertaking an artillery fight, and at this distance, according to the *Progrès Militaire*, the bullets would not penetrate a soldier's haversack! The breech system is also too delicate, and the slightest shock disarranges it; the earth or sand which settles on it prevents its action. One could, it is true, improve the efficacy of the shrapnel by increasing the weight of the bullets; it is far more difficult to modify the breech and to make it less subject to derangement.

The *Revue* says that the ammunition wagon is placed "wheel to wheel" with the gun. The gunner who serves the ammunition, and who is also responsible for the fitting of the fuse, places himself, during the firing, under cover behind the ammunition wagon, which is also covered with a steel-plate shield on the side exposed to the enemy. These shields for the ammunition wagon, as well as those for the gun, increase considerably the weight of the *matériel*, and does not, according to some journals, give it a mobility much superior to that of the old "Bange" *matériel*, which has been made the subject of investigation.

During the fire, the horses are taken to a distance under cover, as was done with the old *matériel*.—*Revue Militaire Suisse*.

A presidential decree of the 25th November last, creates two new foot batteries. There only remains to appoint a battalion staff and two batteries to ensure the complete carrying out of the law of the 25th July, 1893, fixing the composition of foot artillery at 18 battalions, numbering altogether 106 batteries.—*Bulletin de la Presse et de la Bibliographie Militaires.*

The following Military Race Meetings for the month of March, at Nantes, announced by the *Revue de Cavalerie*, may be of interest.

CONCOURS HIPPIQUE DE L'OUEST.

At Nantes (the St. Pierre Course). On Sunday the 5th, and Sunday the 12th March, 1899. Military Meeting. Prizes consist of Gold Medals. Officers' chargers borne on the rolls of regiments quartered in the district and ridden by officers of the Cavalry of the Line, of the Reserve, of Light Cavalry, or other branches of the Service, on the Active List, in uniform, and belonging to these regiments.

Prix des Régiments.

Twice round the course. At least eight obstacles.

1st Section.

Horses ridden by Officers of the Cavalry of the Line, of the Reserve, or other branches of the Service. Four prizes value 100frs. each ... ... 400frs.

2nd Section.

Horses ridden by Officers of Light Cavalry. Four prizes value 100frs. each 400frs.

Total ... ... 800frs.

The President and Committee have the power to transfer prizes of one section to the other, according to the number of horses starting.

Prix de Circonscription.

Three times round the course. At least twelve obstacles.

Three prizes value 200frs. each—600frs.; Four prizes value 100frs. each—400frs.

Total ... ... 1,000frs.

Prix de Clôture. (Handicap.)

Twice round the course. At least nine obstacles.

1st prize, value 300frs.; 2nd prize, value 200frs.; 3rd prize, value 100frs.; 4th prize, value 100frs.

Total ... ... 700frs.

Grand Total ... ... 19 prizes, 2,500frs.

GERMANY.—*Recruiting Statistics for the year 1897.*—The number of young men who reached the age for military service amounted to 531,913. By adding to this those who were postponed in 1895 (340,461), and in 1894 (245,124), and those of prior classes (74,663), one gets 1,192,161 men as the gross total of the recruiting resources.

The classification has been made as follows:—

Unfit for service		38,191
Debarred from service		1,267
Recruits failing to appear		162,749
Postponed		546,759
Enrolled in the Land Forces	Combatant (*a*)	214,541
	Non-combatant (*b*)	4,447
Enrolled in the Navy		4,681
Assigned to the Recruiting Reserve	Army	82,610
	Navy	910
Liable to 1st Levy of Landsturm		104,950
Surplus of young men who are fit		9,823
Enlisted voluntarily in Army (*c*)		20,507
,, ,, Navy		726
Total		1,192,161

The number of young men who enlisted in the Army before attaining the age for military service reached 20,808. By adding this total to those mentioned under headings *a*, *b*, and *c*, one arrives at a total contingent of 260,303 men embodied during the year 1897.—*Bulletin de la Presse et de la Bibliographie Militaires.*

The new formations of field artillery which the military law, submitted to the Reichstag, foreshadowed, are now clearly defined. Each division will be provided with a brigade of two regiments of six batteries. This is

the rule, but each rule has its exceptions: thus the 37th Division at Allenstein, in Western Prussia, and the 38th at Mulhausen, will only have a single regiment. This regiment will be subordinate to one of the two brigades of the army corps. Only six regiments will be entirely newly created (not counting Bavaria, which will not be completed for some years), viz., the 73rd at Allenstein, the 74th and 75th at Erfurt, the 76th at Fribourg, the 77th and 78th at Leipzig.

The other regiments will be transformed by the simple expedient of splitting them up: thus the two Guard regiments will be formed into four. With regard to other corps, the 36th Regiment, for example, will furnish the nucleus for the new 72nd Regiment. It is easy to discover the numbering of the new regiments by adding 36 to the number of the old regiment from which they originated. In the Grand Duchy of Baden the 14th Regiment splits into two to form the 50th Regiment, both of them at Carlsruhe; the 30th Regiment at Rastatt gives birth to the 66th at Offenburg. In Wurtemberg, the 13th at Ulm furnishes the 49th Regiment; the 29th at Ludwigsburg the 65th. According to the new scheme we have a total, not including Bavaria, of 4 regiments of Artillery of the Guards, and 78 regiments collected together from other corps; in all, 82 regiments. Besides which, six groups of horse artillery of two batteries will be kept apart, which will serve to endow future cavalry divisions.

The brigades of field artillery will be numbered according to their divisions. There will be two in the Guards and 38 in other corps. The Grand Duchy of Baden, for instance, will have the 28th and 29th Brigades, the first at Carlsruhe (the 14th and 50th Regiments), and the second at Fribourg (the 30th and 66th Regiments), and, finally, a 76th Regiment for the division at Mulhausen. The 14th Regiment will, over and above, include a group of horse artillery of two batteries. In Prussia they dispose, in all, of 20 batteries of horse artillery, who will be incorporated in the ordinary groups of three batteries, as will also the howitzer field batteries of the 4-inch calibre, that are about to be organised this year.

At the end of the year 1900 the field batteries of the Empire, not counting Bavaria, will be as follows:—

Divisional horse batteries	20
Ordinary independent horse batteries	20
Field batteries, with 3-inch or 4-inch guns	472
Total	512

Bavaria will reckon:—

Field batteries	60
Horse ,, ...	2
Grand total	574

Besides these 574 batteries, Germany, in war-time, has also at her disposal the batteries undergoing instruction at the shooting school at Jüterbog, of which the effective strength, according to the scheme, is six to nine batteries, divided into three groups of three batteries each. On a peace footing field batteries have an effective strength of a high standard (*Hoher Etat*), one of an ordinary or medium (*Mittlerer Etat*), and one of a reduced or lower standard (*Niederer Etat*). A battery of the effective strength of the high standard consists of six guns with six horses and two or three ammunition wagons with six horses. Twelve field batteries and twenty-two horse batteries are included in this category, the latter destined for cavalry divisions. The battery of an ordinary or medium effective strength has six, that of the lower effective only four field pieces; 311 batteries belong to the ordinary and 229 to the lower effective.

A Field Battery reckons on a peace footing—

—	Officers.	N.C.O.'s and Men.	Saddle Horses.	Draught Horses.
High Standard	4	125	19	56
Ordinary Standard	4	110	18	42
Lower Standard...	4	100	16	28
On a War footing	5	168	36	124

A Horse Battery on a peace footing—

High Standard	5	125	79	56
Lower Standard	4	90	57	28
On a War footing	5	157	116	124

On a war footing the carriages are the same in a field and horse battery, viz., six pieces of ordnance, nine ammunition wagons, two store wagons, one provision and one forage cart.—*Revue Suisse Militaire.*

The *Reichs-Anzeiger* published last month the following details of the new Army augmentation scheme:—

From the 1st October, 1899, the effective peace strength will be augmented in such a manner as to reach during the year 1902 an annual average of 502,506 soldiers and "Gefreite." This effective strength will be maintained till 31st March, 1904. The different States of the Empire which have a special Military Administration will participate in this effective augmentation *pro ratâ* to their population.

The voluntary enlistments of one year do not count in the effective peace footing.

By these augmentations the situation at the end of 1902 should be as follows (the number in brackets represents the present effective strength):—

Infantry	625 battalions	(624)
Cavalry	482 squadrons	(472)
Field Artillery	574 batteries	(494)
Foot ,, ...	38 battalions	(37)
Pioneers	26 ,,	(23)
Troops for Communication	11 ,,	(7)
Military Train	23 ,,	(21)

All foot soldiers, men of the Field Artillery, and Military Train who remain voluntarily for three years with the colours, as well as men of the Cavalry and Horse Artillery who remain three years with the colours, will only pass three years in the Landwehr.

This law applies equally to Bavaria and Wurtemberg.

The assemblage of 2 or 3 regiments forms a brigade, that of 2 or 3 brigades of infantry or cavalry with the junction of the necessary artillery, forms a division. A group of 2 or 3 divisions, with foot artillery, pioneers, and the necessary military train, forms an army corps, in such a manner that, in peace-time, the German Empire will be composed of 23 army corps. Bavaria forms 3 army corps, Saxony 2, Wurtemberg 1, Prussia and the other States form 17.

The German Empire is, from a military point of view, divided into 22 Army Corps Districts.

This law will come into force from the 1st April, 1899, and will apply to Bavaria and Wurtemberg.

The scheme, then, provides for the formation of three new corps, viz., the XVIIIth Corps, formed by splitting up the XIth; the XIXth Corps (Saxon), formed

by the splitting up of the XIIth (Saxon); and finally the IIIrd Corps (Bavarian), formed by transfers from the two existing Bavarian corps.

The following table from the *Neue Militärische Blätter* shows the number of new corps and the districts in which they are to be formed, viz. :—

Species of Arm.	Prussia.	Saxony.	Wurtemberg.	Bavaria.	Total.
1. Infantry.					
Brigade Staffs	...	1	...	...	1
Regimental Staffs	...	1	...	...	1
Battalions	...	1	...	...	1
2. Cavalry.					
Regimental Staffs	3	...	...	...	3
Squadrons	8	1	...	1	10
3. Field Artillery.					
Brigade Staffs	18	3	1	4	26
Regimental Staffs	37	5	2	7	51
Divisional Staffs	14	6	...	6	26
Batteries	54	17	1	8	80
4. Foot Artillery.					
Regimental Staffs	1	...	...	...	1
Battalions	1	...	...	...	1
5. Pioneers.					
Battalions	1	1	...	1	3
6. Troops for Communications.					
Railway Companies ...	4	...	...	...	4
Telegraph Battalions ...	3	...	...	...	3
Single Telegraph Companies	...	1	...	1	2
Telegraph Detachments ...	...	...	1	...	1
Ballooning Companies ...	1	...	...	...	1
7. Military Train.					
Battalions	...	1	...	1	2
Single Companies	1	...	...	...	1

HOLLAND.—As in preceding years, the quota of 1899 has been fixed at 11,000 men, of which 510 are for the Navy. The number of those registered is raised to 46,285 men.

In virtue of the law of the 29th March, 1877, mounted officers are authorised to select their chargers, from amongst those of mounted branches, at the average price of a remount of the preceding year. But certain officers could with difficulty benefit by the provisions of this law, owing to want of direct relations with the mounted arms. In order, therefore, to remedy this state of affairs, the Minister of War has directed that commanding officers of cavalry regiments or horse artillery should place at the disposal of officers, who are not able to find a suitable mount, one or several horses for trial. The requisition should be made through the commanding officer of the officer interested.—*Bulletin de la Presse et de la Bibliographie Militaires.*

ITALY.—*Recruiting Statistics for the year 1897.*—The number of young men of the 1876 class registered on the levying list amounted to 308,545. By including those postponed from the 1875 and 1874 classes, which amounted respectively to

72,975 and 38,150, one obtains a total of 419,670 registered men, as the recruiting resources, who are classified in the following manner :—

Unfit for service	108,326
Debarred from service	129
Recruits failing to appear	19,000
Postponed	103,566
Enrolled in the Land Forces (*a*)	90,749
Surplus of young men who are fit	1,681
Posted to Territorial Militia	92,273
Enlisted as Volunteers in the Army (*b*)	3,946
Total	419,670

By adding, to the numbers indicated under the headings *a* and *b*, the number of those who enlisted voluntarily before the age for military service, say about 3,530, one obtains a total contingent of 98,225 for the year 1897.—*Bulletin de la Presse et de la Bibliographie Militaires.*

The final establishment for the maintenance of the Army for the current financial year (1st July, 1898, to 30th June, 1899) has been fixed. It borders on 239 million lire (as it has done for many years), of which about 22 million go to the ordinary expenditure. The principal items are, in round numbers, as follows :—

War Ministerial Department	2½ million
Appertaining to higher Commands & Superintendence	4 ,,
Infantry	64 ,,
Cavalry	2½ ,,
Artillery and Engineers	23 ,,
Carabineers	26½ ,,
Sanitary Service	4 ,,
Commissariat and Pay Departments	2½ ,,
Training Institutions	2½ ,,
Penitentiaries	1 ,,
Travelling and Transport	3½ ,,
Clothing	17 ,,
Maintenance	14 ,,
Forage	16 ,,
Barrack	4½ ,,
Remount	4½ ,,
Matériel & Technical Artillery Institutes	6 ,,
,, ,, Engineer ,, ...	6 ,,
Rent	1 ,,
Sanitary Material	½ ,,
Target Practice	½ ,,

Out of the Extraordinary Expenditure of about 17 million, the manufactory of arms at 2½ million, and the national defence at 12½ million, has a larger share. Under the output for the last purpose the following items are most conspicuous, viz. :—5 million for fortresses, ½ million for heavy coast ordnance, 2,600,000 lire for coast and frontier defence, and 400,000 for the building of the fortifications of Rome and Capua. The estimate for the following financial year, 1899-1900, shows the ordinary expenditure at 222,970,000 lire, and the extraordinary at 1,470,000 lire. In addition, however, by a special regulation, the remodelling of the artillery is provided for at a cost of about 14,560,000 lire, thus bringing up the total again to 239 million.

From the Ordinary Expenditure a medium strength of 13,527 officers, and 212,200 non-commissioned officers and men, and 9,543 officers' and 36,628 troop chargers, have to be maintained; besides which, about 93,000 men of the Reserve should be called up for 20 days' instruction, and 200,000 lire will be expended on the support of the families of the men so called out.

Out of the Extraordinary Expenditure, 1 million is put aside for coast defence, 250,000 lire for building purposes, and 200,000 lire for the fortifications of Rome and Capua.—*Militär-Wochenblatt.*

In accordance with the Act of the 2nd July, 1896, lieutenants of the Royal Carabineers (Gendarmerie) proposed for promotion by selection have to undergo a special examination, and must further reckon in seniority with the first dozen subalterns (lieutenants and sub-lieutenants) of that branch of the Service. The *Gazzetta Ufficiale* publishes a decree of the 27th November, 1898, which determines as follows the syllabus of the examination mentioned above :—

1st Written Test.—Elucidation of a subject relating to the particular subject of the Royal Carabineers.

2nd Oral Test.—Discussion of questions chosen from the following rules and regulations :—The Common Penal Code ; the Military Penal Code ; regulations for the Public Safety ; regulations on the Requisitioning of Horses ; regulations on the Execution of Laws for Recruiting ; regulations on Military Discipline ; regulations on the Organisation, Instruction, and Duties of the Royal Carabineers ; regulations on Territorial Service.

3rd Practical Examination.—Tactical Command of a Troop in the Field. The decree adds that the Minister of War will give detailed orders such as he may deem proper for the assembly of candidates, the correction of the written compositions, etc.—*Revue du Cercle Militaire.*

RUSSIA.—*The Rouskii Invalid* publishes a decree of the Minister of War regarding the creation, in the military circumscription of Vilna, of a new battalion of sappers consisting of four companies, one of which is to be a Telegraph Company. Besides which the half-battalion of Sappers of Turkestan (two companies) of the 2nd Brigade of Sappers, will be completed to four companies, and that of Eastern Siberia will obtain a third company.

It is a question then of the creation of seven companies of sappers (including the Telegraph Company), which will bring up the number of companies to 91. It is of course understood that the companies of Garrison Engineers are not included in these numbers.

Regulations of 1898 lay down as follows the effective peace and war footing of the light batteries of the Amour District :—

Rank.	Peace footing.	War footing.	Observations.
Officers.			
Commander of Battery...	1	1	(*a*) 1 Captain of 1st and 1 of 2nd Class.
Captains of 1st or 2nd Class (*a*) ..	2	2	
Lieutenants or Sub-Lieutenants ...	3	3	
Total	6	6	
Troops, Combatant.			
Sergeant-Major	1	1	
N.C.O.'s { Section Commanders ..	4	5	
N.C.O.'s { Master-at-Arms	3	3	
N.C.O.'s { Inferior	8	16	(*b*) Each battery may have in addition a man enlisted conditionally to support himself at his own expense.
Enlisted Conditionally (*b*)	1	1	
Trumpeters	2	3	
Gun-layers	8	10	
Artificers	8	10	
Belonging to Gun Detachments ...	25	40	
Gunners	106	172	
Total	166	261	

Rank.	Peace footing.	War footing	Observations.
Non-Combatants.			
Clerks	1	2	
Doctors	2	1	
Veterinary Surgeon	1	1	
Assistant Surgeon	1	—	
Hospital Orderlies	1	2	
Tailor	1	1	
Battery Artificers	6	6	
Artillery Train	—	40	
Total	13	53	
Total of Troop	179	314	
Horses.			
Saddle { Officers'	5	5	
Saddle { Troop...	11	22	
Artillery Team	27	243	
Artillery Train	—	21	
Pack Horses	6	22	
Total	49	313	

The batteries harness in war-time 8 guns, 8 four-wheeled ammunition wagons, 24 two-wheeled ammunition wagons, 6 two-wheeled vehicles for *matériel* (Model 1890), 1 spare gun carriage and the train.

In peace-time they only harness 4 guns.

The train of these batteries includes:—18 two-wheeled carriages of the artillery train (Model 1890) and 20 two-wheeled carriages of the commissariat train.

During peace-time the first 4 batteries of the 1st Brigade of Western Siberia, and the 3rd and 4th Batteries of the 2nd Brigade of Western Siberia, will keep in men and horses, the same effective as in war-time, except as regards the train, which only includes 5 two-wheeled carriages. The 1st and 2nd Batteries of the 2nd Brigade and the two batteries of the Trans-Baikal independent group will have their war effective of men, and will yoke 8 guns, 24 two-wheeled ammunition wagons, and 6 two-wheeled carriages for *matériel*.

It should be borne in mind that the 1st Artillery Brigade of Western Siberia, whose headquarters are at Nikolskoe, includes 4 light field batteries, 2 mountain batteries, and 2 mortar batteries; the 2nd Brigade of Western Siberia, whose headquarters are at Blagoviechtchensk, is composed of 4 light field batteries; the Trans-Baikal independent group, at Nertchinsk consists of 2 light field batteries.—*Revue Militaire de l'Étranger.*

An order to the troops in the district of Varsovie lays down the following dispositions relative to the manœuvres to be executed during the winter period:—

All troops in the district will execute, as in preceding years, manœuvres during the winter period, and will bivouac once. They will besides undertake field firing with the manœuvres, and military marches.

1. All troops, without exception, should execute winter marches; in the infantry every man, except those absolutely necessary for barrack duty, must take part in them; in the cavalry every available horse must go out; all officers must be present.

2. Each corps should execute at least two marches a month; these marches will be made in accordance with a tactical scheme, and will end either by a manœuvre against an imaginary enemy, or by a manœuvre of opposing sides,

always under the condition of not causing damage to the fields. In that case only route marching along the roads will be undertaken.

3. Marches will be undertaken in all weathers, and to accustom the men to rapid and prolonged movement; they will be made longer and longer in such a way as to attain a distance of 30 kilometres (about 18¾ miles) without fatigue; the men will always carry a complete field kit.

4. Independently of these marches, all the troops will execute one manœuvre of two days' duration with opposing sides, and will bivouac on the ground. Young soldiers will not take part in it.

5. Manœuvres will not take place at a lower temperature than 10° Réaumur. If during the night of the bivouac the thermometer should fall below 12°, the men must be roused to execute a night manœuvre, after which they will immediately return to barracks; the manœuvre will be considered finished.

6. The marches and manœuvres will include, as far as possible, detachments of the three arms.

7. Independently of cavalry and artillery units stationed in the same garrisons as the infantry, it is desirable to assemble in the same way small detachments of these arms, who would not have to make too trying marches, to take part in the manœuvres. In order to save deterioration of material, it is allowable in winter to only harness batteries of four guns.

8. During manœuvres, biscuits should be used in a great measure for the nourishment of the men, to accustom them to the preparation and use of this food when flour can be had, but the time and the means to cook it are wanting.

9. In order to maintain cavalry fit for action, they should execute at least twice a month the regulation manœuvres, or manœuvres with an imaginary enemy. When squadrons have separate quarters, they will be assembled, in that case, in regiments of five, four, or even three squadrons, in order that those who are unable to participate in the general manœuvres may be instructed independently, or formed into groups. Also no more horses than is necessary should be unshod in regiments, on account of the difficulty in shoeing them.

10. All corps should execute field firing during the winter manœuvres.

11. If it is impossible to assemble detachments of the three arms for this firing, then at least two of them must be assembled; in case of the absolute impossibility of getting any other branches of the Service together, the units must go through the firing by themselves.—*La France Militaire.*

SERVIA.—The *Srpske Novine* publishes a regulation on the marriage of officers, non-commissioned officers, and soldiers, which replaces the regulation of the 20th October, 1872. This regulation is of special interest to officers, for it appears to aim at two objects, viz., first to raise the material status and the popular estimation of the officer by sensibly increasing the amount of the marriage portion, and finally to create a species of military caste by reducing in a great measure the required sum of money when there was a question of marriage with an officer's daughter, in order to facilitate this kind of union. Sub-lieutenants and lieutenants, having less than two years' service in that rank, are forbidden to marry. Lieutenants having more than two years' service in that rank, and officers of superior rank, can only marry with the authority of the Minister of War. They must first address a request of "preliminary permission" to the Commander of the Active Army. Should this permission be accorded him, the officer prefers a request for "positive permission" to the Minister of War. The Minister must ascertain if the marriage is a suitable one as regards the respectability of the girl concerned, and that the officer has no debts. Lieutenants and captains of the 2nd or 1st Class must besides prove the possession of certain means, either personal or brought as a marriage portion by their future wife; these means are considered independently of the pay they receive from the State. Superior officers

and generals are exempted from having to prove the possession of some personal property.

The minimum means exacted are :—

For Captains of the 1st Class an income of 1,000 francs.
" " 2nd Class an income of 1,500 francs.
For Lieutenants an income of 2,000 francs.

If the *fiancée* is an officer's daughter the amounts are reduced respectively to an income of 600, 700, and 800 francs.

The marriage portion may consist of specie, of personal property, or real estate. If the fortune consists of real estate, the landed property must be valued by two local proprietors, in the presence of a police officer. Should it be proved that the valuation of the marriage portion has been made too high, the three members of the commission "are punished by imprisonment from six months to two years, and are besides compelled to pay to the married couple the difference between the actual value of the marriage portion and the estimate which they made."

Every officer who contravenes the marriage regulation will be judicially deprived of his rank. Married civilians who wish to become officers must prove that their union fulfils the conditions required by regulation. The same is necessary for pensioned and retired officers who wish to re-enter the Service, and who married after leaving the Army.

As regards non-commissioned officers and soldiers, marriage was, under former legislation, absolutely forbidden. In spite of that, it was occasionally tolerated in those whose future justified the possession of an income of 300 francs. The question is thus provided for by the new regulation. Only sergeant-majors may marry who have five years' service in that rank, and who prove the possession of property either personal, or by marriage portion, amounting to an income of 600 francs. Permission to marry is given them by the Commander of the Active Army or by the military authorities who have the power to make appointments to the rank of sergeant-major. Married non-commissioned officers can never become officers.

Sergeant-majors of less than five years in that rank, other non-commissioned officers, corporals, and privates serving with the colours, may not marry. But soldiers sent on temporary leave of absence (sometimes after only five months' service) may marry without permission. This comes to the same thing as saying that recruits alone are not allowed to marry. It is understood that young men are at liberty to take to themselves a wife before entering the Service, and in Servia the tendency is to marry young, for in 1897 out of 13,600 recruits called out, 3,630 were married, viz., about 27 per cent. The regulation of the 21st August, 1898, lays down that priests who celebrate the marriage of a military man without having the necessary written authority, will be punished by imprisonment from six months to one year, and by a fine of from 1,000 to 2,000 francs.—*Revue Militaire de l'Étranger.*

SPAIN.—The loss of Cuba and the Philippines, as well as the disbandment of certain bodies of troops who garrisoned these colonies, has caused an excess of officers (about 6,000) in the Army of the Peninsula, whose services the Government is endeavouring to utilise to the best interests of the country. It was at first thought that they might find employment in the land registry offices, but this project, which presented grave difficulties from a practical point of view, has been abandoned. The latest news, according to some Spanish papers, is that the Ministry is about to entrust to them the establishment of a "fiscal registry for urban property."

For this purpose offices have been established in 45 out of the 49 provinces into which Spain is divided. The exceptions are the provinces of Alava, Biscaya, Guipuzcoa, and Navarre. In this way employment will be given to 45 colonels,

45 lieutenant-colonels, about 200 majors, more than 600 captains, and 1,700 lieutenants or sub-lieutenants. It has, besides, been decided to raise a third battalion to infantry regiments and a fifth squadron to cavalry regiments, to organise reserve units for the artillery and engineers, to increase the forces stationed at the Canaries by transforming their district Chasseur battalions into regiments, and to proportionately raise the effective of the other arms in this Captain-General's command. Special efforts are being made to gradually absorb the corporals and N.C. officers, over and above the effective provided for by the organisation regulations.—*Militär-Wochenblatt.*

The regulation effective for the troops of the Peninsula fixed by a Royal Order of the 9th July, 1898, and modified the 25th November the same year, is as follows :—

	Officers.	Men.	Horses.
Infantry	5,031	63,991	588
Cavalry	1,285	14,386	10,935
Artillery	822	12,063	3,849
Engineers	274	5,539	320
Administrative Troops	29	1,500	431
Medical Staff	37	901	126
War Depôt and Brigade Topographical Staff	59	406	36
Special Service Troops	36	747	101
Total regulation effective for the Spanish Army on a peace footing	7,573	99,533	16,386

SWITZERLAND.—By order of the Federal Council, the 1st Army Corps is named to execute, in 1899, manœuvres in the district situated between the Sarim (an affluent on the left bank of the Aar) and the lakes of Neuchâtel and Bienne. With some exceptions all the troops of this army corps will enter on their duties on the 29th August, and will be disbanded on the 15th September. The actual manœuvres will commence on the 5th September by exercises of regiment against regiment.

The 1st Army Corps consists of the 1st Division, which is recruited in the Geneva and Vaud Cantons, as well as in the western part of the Valais Canton (Bas-Valais), the 2nd Division, whose components belong to the Canton of Fribourg, the Canton of Neuchâtel, and the north-west portion of the Canton of Berne (Jura bernois).—*Revue du Cercle Militaire.*

UNITED STATES.—The question of the relative merits of the Krag, the Lee, and the Mauser being under discussion, it is well to recall the fact that the preference was given the Krag over other arms by the Board selecting it because it was believed to be the best single-loader in existence. The report of the Board of 1890-92 was made after an examination of fifty-three guns presented by American and foreign inventors, many of the guns being the adopted arms of the principal military Powers of Europe. "The arms were all subjected to a uniform test, which was careful and exhaustive." The model known as the Krag-Jorgensen No. 5 was selected "as possessing the best magazine system, and as a suitable and satisfactory system to be adopted for the Service." This arm could be used as a single-loader, and as a single-loader the Board found that "it was the best arm that was presented." This recommendation, at the hands of the United States Army Board, carried with it great weight in view of the fact that the Springfield rifle, then so much in favour in our Service (in reduced calibre ·30), was tested in competition with the Krag-Jorgensen rifle, both arms being used as single-loaders, the reserve supply of the magazine gun being

"cut off" by a mechanical device attached to the gun, something in the nature of a thumb or finger latch, which can be operated with facility in the adjustment of the magazine feed. The Mauser rifle, which is classed as of the "repeating type of magazine arms," is not well adapted for single-loading fire, since its "clip" supply of ammunition, in groups of five each, renders it inconvenient for this purpose, and to this extent restricts its use to that of magazine fire. The advantage the Krag has over the Mauser in this respect was considered very important by the Board in view of the danger of the waste of ammunition by the raw troops upon whom we should have to depend in case of war. Remembering that for a period somewhat exceeding 90 per cent. of the whole time in which troops are actually engaged in conflict, deliberate fire and good marksmanship are at a premium, it was held that the deliberation which accompanies single fire and single loading should more than offset any possible advantage due to a mechanical process "of grinding out cartridges by the clipful."

The test of service in Cuba under unusually trying conditions was very favourable to the mechanism and manufacture of the Krag-Jorgensen gun, but there is no doubt that the result of our experience there was to give our officers and men a great respect for the Mauser, not as a superior arm, but as embodying the magazine system of loading, the very feature to which the Board objected. This system has not enjoyed the favour of our Ordnance Department, and the full statement of the whys and wherefores made a remarkably strong case—until we faced one of those magazine guns and found it was more objectionable to us in front than to the men who held it. We found then that we had the wrong end of the argument—not that we want to pump out shot by the clipful all the time, but because in some situations the ability to do so may become a critical advantage.

All the great European Powers, except Great Britain, have adopted rapid-fire magazine rifles, capable of being loaded by the use of a clip, enabling the soldier to load five shots about as quickly as the Krag-Jorgensen can load one; and Great Britain, which has a single-loader, is engaged in devising means by which the Lee-Metford, used in the British Army, can be loaded in this manner. The Krag-Jorgensen, Mauser, Männlicher, and Lee-Metford, so far as their range, penetration, and velocity are concerned, have little advantage one over the other, but in rapidity of fire, if any, the Mauser and Lee straight pull, in use in the United States Navy, are in advance of the Krag-Jorgensen or Lee-Metford. This defect of the Krag has been removed by a very simple and effective attachment, invented by E. G. Parkhurst, of Hartford, who has been long connected with small-arms factories, and is an inventor and expert engineer. He was lately consulting engineer of the American Ordnance Company. This simple device is called a "clip-actuating device," or "a cartridge clip or magazine filler, which enables cartridges to be fed from said filler into the magazine of guns of the Krag-Jorgensen type." This device weighs only about 1 oz., and by its use the Krag-Jorgensen is converted from a single-loader to the most rapid repeating magazine army rifle in the world. We have seen and examined this invention, and its strength, simplicity, and ease of operation indicate that the inventor's hope of producing the most rapidly-loaded gun in the world may have been reached.

The new part is simply a clip-holder. The clip is not of the box shape, but is a rim clip, the cartridges being held in its grooves by a spring at each end. Mr. Parkhurst's attachment is a small steel forging, shaped to receive the end of the clip and to open the end spring by the movement of shoving the clip down to its seat. The five cartridges then hang over the magazine box, with nothing but the hold in the grooves of the clip to keep them from falling in. A slight push by the thumb close to the clip then thrusts the five shells into the box. Shutting the box ejects the clip automatically, and the gun has five charges in it.

Mr. Parkhurst's invention has no movable part, is attached at the end of the cartridge-box, does not cut away the gun, and does not interfere with any of the

present motions of the mechanism. Its cost has been estimated at 20 cents or less.

If the arguments which decided the Small-Arms Board to select the Krag were sound, it must be still the best gun in mechanism, and Mr. Parkhurst's invention will make it at least the equal of any other in the world in rapidity of fire. He has removed whatever doubt hung over the American arm. Inventors are never regarded with favour in ordnance offices, but the interests advanced by this invention are too important to permit its neglect. It is too simple to be replaced easily by another invention as good.

We hope it will be approved in Washington, for it will make our present stock of 150,000 Krags as available in any situation as any arm in the world. It is as applicable to cannelured as to rim cartridges without other change than a slight one of dimension.

The following is an extract from the manual by General Roystone, of General Miles's Staff, for making temporary roads, which was written for the use of the American forces invading Spanish colonies. It was published in the *Engineering Record* by permission of the author and General J. M. Wilson, Chief of Engineers, United States Army :—

"If the road is an important one it should have about 16 feet of travelled way, and, to allow for ditches on either side, the ground should be cleared at least 30 feet wide. Running through a wooded country, the advance or clearing party should be equipped with axes, machetes, bush scythes, and a few forks, and should be instructed to cut and clear away all vines, weeds, and small undergrowth, and to bind up into bundles all small bushes less than an inch in diameter at the ground ; these bundles to be kept for repairs of roads.

"If there is heavy timber, the second gang, equipped with axes and saws, will chop out all trees, leaving the roots in the ground, but no stumps, and saw the trees into such lengths as will allow the logs to be hauled or rolled off the roadway. If, however, excavation is required at any point to secure a proper grade, the timber there should be grubbed out, while standing, in the manner described hereafter.

"A third gang, equipped with axes, hatchets, and twine, will cut bushes from 1 to 3 inches in diameter, and make them into fascines or bundles by partly cutting off each limb from the inside, Fig. 1, and then binding the limbs tightly to the trunk, putting as many ties of twine around as are necessary to hold the bundle close, except near the top, Fig. 2. All bushes and saplings above this size to be cut down, and the top portion made into a fascine. If the saplings are not bushy enough to make a thick bundle, two or more of them should be put together so as to make the fascine from 8 to 12 inches in diameter and from 8 to 10 feet long. If the supply of bushes and saplings is not sufficient, any straight and bushy branches of larger trees can be made into fascines in the same manner. Only enough of the stem should be left below the lowest limb to make a hold for one hand in handling the fascine.

"The roadbed being cleared, these fascines are to be placed lengthwise of the road, butt-end forward, and as close together as possible, and the top end immediately covered with earth from the ditches alongside, to the depth of about 3 inches, Fig. 3. Strong stakes should be placed at the outside to keep the fascines from spreading ; these can be driven down so that they will not show above the road, and it will be well if each one has a hook at the top turned inward. Succeeding layers of fascines will be placed in the same manner, each overlapping the former layer about one-third of its entire length, and as soon as the earth will hold a layer in place the ties of that layer should be cut ; the work to continue in this manner, care being taken to give the ditches an easy slope inside and outside so that a wagon may be driven off the road without upsetting, Fig. 4 ; if there are trees in the way of this ditching they should be grubbed out the same as for other excavations. A space of 2 feet in width should be left on

each side between the fascines and the ditch and the earth banked up against the fascines for a shoulder.

"Before laying the fascines any roots of trees which show above the surface of the ground must be dug out or chopped down to the ground level. If there is not time to grub out the trees in the ditch and the earth is dug out in spots, these spots should be connected by narrow ditches in order to make a continuous drain. Care should be taken to carry the water across under the road by abundant sluice-ways at all natural points of drainage, so that it may not stand alongside the road even in wet weather. In crossing low, swampy or very soft ground, a layer of poles or canes should first be laid lengthwise of the road, and the fascines then laid crosswise with the butts outward. In this case the fascines must be of uniform size, and for a 16-foot road they should be 10 feet in length, and should be well covered with earth. In laying fascines they should be crowded together with crowbars and made as tight as possible. If they show any tendency to rise either while being laid or in use afterwards, they can be held down by the loop stakes shown in Fig. 5. The larger fascines should be used in the middle of the road, and the low ones at the edges, giving a slight crown to the surface.

"In grubbing out timber where excavations are to be made, if the roots spread at or near the surface, they should be cut at a distance from the tree equal to twice its diameter. If there are successive layers of roots underground, a trench must be dug around the tree in order to cut the lower roots, Fig. 6. When this is done, the tree can be pulled over by a rope attached near the top, carried through a snatch-block at a distance from the tree, and pulled by men or teams, or, if necessary, by a Spanish windlass, such as is shown in Figs. 7 and 8. The Spanish windlass is made of two strong handspikes, the vertical one being held firmly in position by one or two men, it being important to keep it upright, as it would be dangerous to let it tip over when under strain. The line should be pulled as tight as possible by hand before twisting in the horizontal handspike. After the tree has been pulled down and the top cut off, if it has spring enough to rise from the ground it should be pulled again in the opposite direction, the roots showing at either side being cut while under strain. If it does not rise, it can be twisted around to loosen it. When free from the ground the stump can be rolled off the roadway by the use of the windlass– enough of the trunk being left attached to the stump to hold it on its side. Wherever large stumps are found in the way they should be blasted out with dynamite, the cartridge being inserted in a hole bored as low and deep as possible in the base of the stump.

"If in clearing the ground for the road or elsewhere any hollow trees are found, they should be cut in suitable lengths for sluice-ways. If these cannot be had, sluices may be made by digging a trench across the road to the depth of the road ditches, laying a half-dozen stringers across the trench, and extending 2 or 3 feet on the bank on each side, then covering with straight poles laid crosswise of the road and extending a foot over the banks of the trench on each side and beyond the road at the ends, the poles strongly staked to prevent their being displaced and then covered with fascines and a guard-log placed across each end and well staked outside.

"Sluice ways should be made wide enough to carry the heaviest rainfall. The roadbed approaching the sluice must be graded up to the level of the top of the poles.

"For the improvement of sandy roads a layer of any strong fibrous substance, and especially one which holds moisture, such as refuse of sugar-cane or sorghum, and even common straw, flax, or swamp-grass, will be useful. This should be spread upon the surface and then covered with about 2 inches of sand, and recovered as it works upwards. The very best material is fibre from the bark of the palm tree well shredded. A mixture of sawdust and shavings is very useful. Pine needles have but little value, as they work to the surface and are liable to be burned off. Either palm fibre or the long sawdust made in sawing shingles by the machines which cut into the side of the block will make a firm and elastic

road that will endure for some years. Sandy roads are sometimes mended with clay, but in a rainy country the clay soon washes out."

The War Department has settled on the Lewis range-finder for permanent use and has asked Congress for an appropriation of $90,000 to procure range-finders for sea-coast fortifications. In addition to the range-finders, the War Department has placed orders for azimuth instruments for use with the siege trains. These instruments are used in obtaining the ranges in siege batteries. The Board of Ordnance and Fortifications has also recommended the adoption of the Service Sight, a telescopic sight of purely American design and construction. Within the past few weeks the War Department has given an order for 300 telescopic sights of the new design, which when delivered will be immediately attached to the sea-coast guns.

Although the American sight is, in appearance, very like the Scott sight, it is a far superior instrument. The essential difference is that the new sight is provided with the famous "Brashear prisms," which produce an erect image and not an inverted one, as is the case with the English telescopic sight. In detail the new telescopic sight is of the same weight and dimensions as the Scott sight, and has a field view of 6°, with a magnifying power of 8°. The deflection scale is graduated to minutes, and the greatest reading is 2° 30′ each side of 0°. The deflection is adjusted by means of an outside scale, or, what is of inestimable advantage, at any time by the gunner without removing his eye from the eye piece. Besides being adapted for the heavy guns of the sea-coast artillery, the new sight can be advantageously used in connection with the guns of the field and siege artillery. With the completion of the present order, the War Department will possess 450 large telescopic sights.—*Army and Navy Journal.*

NAVAL AND MILITARY CALENDAR.

JANUARY, 1899.

2nd (M.) 1st Bn. Suffolk Regiment left Malta for Dover in the "Jelunga."
5th (Th.) 2nd Bn. Seaforth Highlanders proceeded from Dover to Fort George.
" " Foundation Stone of the Gordon College at Khartoum laid by Lord Cromer.
8th (S.) H.M.S. "Pelican" arrived at Plymouth from West Indies.
9th (M.) Detachment of Royal Irish Fusiliers, 250 strong, left Alexandria for duty at Omdurman.
11th (W.) 1st Bn. Suffolk Regiment arrived at Southampton from Malta in the "Jelunga" and proceeded to Dover.
14th (Sat.) 2nd Bn. Royal Welsh Fusiliers arrived at Hong-Kong from Crete in the "Avoca."
" " Launch of Second-class Cruiser "Albany" at Elswick Works for U.S. Navy.
16th (M.) 1st Bn. Royal Lancaster Regiment left Hong-Kong for Singapore in the "Avoca."
17th (Tu.) H.M.S. "Theseus," "Pegasus," and "Pactolus" commissioned at Chatham, for Mediterranean, S.E. Coast, and Channel, respectively.
19th (Th.) Anglo-Egyptian Protectorate proclaimed for the Soudan.
21st (Sat.) 1st Bn. Royal Lancaster Regiment arrived at Singapore in the "Avoca."
22nd (S.) 1st Bn. West Yorkshire Regiment left Singapore for India in the "Avoca."
25th (W.) 2nd Bn. Dorsetshire Regiment left Malta for England in the "Verona."
" " 2nd Bn. Royal Irish Rifles left Bombay for England in the "Dilwara."
27th (F.) Launch of Torpedo-boat Destroyer "Yugiri" from Thornycroft's Yard for Japanese Navy.
28th (Sat.) British flag hoisted at Atbara and Wadi Halfa.
" " Launch of Torpedo-boat Destroyer "Madsuma" from Yarrow's Yard for Japanese Navy.

FOREIGN PERIODICALS.

NAVAL.

ARGENTINE REPUBLIC.—*Boletín del Centro Naval.* Buenos Aires: November and December, 1898.—"The New Ministry of Marine." "The Electric Installation on board the Training-frigate 'Presidente Sarmiento.'" "Promotion Regulations for the Fleet." "Marine Chronometers." "Electricity and Naval Electricians." "Regulations for French Naval Officers Travelling by Rail." "Electricity in the Spanish-American War." "The Ammunition-Hoists of the Armour-clad 'Almirante Brown.'" "Some Remarks on Naval Tactics."

AUSTRIA-HUNGARY.—*Mittheilungen aus dem Gebiete des Seewesens.* No. 2. Pola and Vienna: February, 1899.—"The Development of the Imperial Navy during the last 50 Years" (*continued.*) "Study on the War between the United States and Spain." "Successful Gunnery Practice at Sea" (*continued*). "The Destruction of the U.S. Battle-ship 'Maine.'" "The German Battle-ships of the 'Kaiser Friedrich III.' Class." "The New Division-boat 'D 10.'"

BRAZIL.—*Revista Maritima Brazileira.* Rio de Janeiro: November, 1898.—"The Ministry of Marine." "On Submarine Boats." "Report on Coal Trials on board the 'Tiradentes' made to the Minister of Marine." "Practical Guide for the South Coast of Brazil" (*continued*). "Armour and Guns." "Treatise on Modern Naval Tactics." "The Battle-ship of the Future."

December, 1898.—"Treatise on Naval Tactics" (*continued*). "Practical Guide for the South Coast of Brazil." "International Rights in Japan." "Foreign Navies."

FRANCE.—*Revue Maritime.* Paris: December, 1898.—Has not been received.

Le Yacht. Paris: 7th January, 1899.—"Steam Yachts Considered as Auxiliaries for a Fleet." "The Navy and New Constructions at the End of 1898." "Yachting Notes." "The Trials of the 'D'Entrecasteaux.'" "The Question of Measurement for Yachts." 14th January.—"The Respective Risks of France and England in Case of War." "Yachting Notes." "Vessels of Small Tonnage in Bad Weather." "The Question of Measurement for Yachts." "Foreign Navies in 1898." 21st January.—"Submarine and Submersible Boats." "Yachting Notes." "Superior Council of the Merchant Navy." "The Question of Measurement for Yachts." "Foreign Navies in 1898." "Vessels of Small Tonnage in Bad Weather." 28th January.—"Steam Yachts Considered as Auxiliaries for a Fleet." "Yachting Notes." "The Question of Measurement for Yachts." "Official Trials of the Life-boat 'Henry.'" "Routes Adopted by the Trans-Atlantic Companies."

Le Moniteur de la Flotte. Paris: 7th January, 1899.—"The Naval Red Cross." "The Navy in 1898." "The Fisheries and Ostriculture." "Colonial Notes." 14th January.—"The Defence of our Coasts." "The Navy in Parliament." "The Estimates." "M. Lockroy at Toulon." "The Newfoundland Question." 21st January.—"Pleasure Yachts and Torpedo-boats." "The Navy in Parliament." "Superior Council of the Merchant Marine." "Subscription for the Purchase of a Submarine Boat." "Colonial Notes." 28th January.—"The French Navy League: An Appeal." "The Navy in Parliament." "Submarine Boats: Foreign Opinions." "The Navy at the Exhibition of 1900." "Naval Engineers at Sea and on Land." "Carrier Pigeons and the Trans-Atlantic Steamers." "Colonial Notes."

La Marine Française. Paris: 15th January, 1899.—"The War with England." "The Defence of the Coasts." "Spanish Impressions on the Battle of Santiago." "Corsica: a *Point d'Appui* of the Fleet." "The Construction of Auxiliary Cruisers." "France in Africa" (*continued*). "Hulls and Boilers."

GERMANY.—*Marine Rundschau.* Berlin: February, 1899.—"To the 27th January." "The Cruise of the 'Hohenzollern' to Palestine." "The War between Spain and the United States, and its Lessons." "The Application of Electricity to War-ship Purposes." "Improvements in the Lower and Outer Weser." "Sketches from the War between Spain and the United States." "The Work of the Navy in Suppressing the Arab Rebellion in East Africa, 1888-89." "A Fleet in Being" (*translated*).

ITALY.—*Rivista Marittima.* Rome: December, 1898.—"Removal of the Remains of Christopher Columbus to Spain." "To the Lafole Monument." "The Necessary Fleet." "Letters of Admiral Cervera." "On the Measurement of Racing Yachts and the Method of Determining it." "The Sea Traffic in Italian Harbours in 1897." "The Condition of the Fisheries in Italy." "Mahan and Callwell." Letter to the Director:—"In Defence of Torpedo-boats." "Naval Notes."

PORTUGAL.—*Revista Portugueza, Colonial e Maritima.* Lisbon: January, 1899.—"Portugal and France." "Colonial Agriculture" (*continued*). "America of the Future and the Parent Country." "Portuguese and African Affairs." "Portuguese Nyassa." "New Instrument for Measuring the Magnetic Movement of the Needle."

SPAIN.—*Revista General de Marina.* Madrid: January, 1899.—"The 13th June, 1898." "Instruction for the Use of the Electric Needle, and the Apparatus for Regulating Compasses." "The Maritime Fisheries." "Organisation of the Archives of the Captain-General of Cadiz" (*continued*). "Cruiser Tactics" (*continued*). "The Port Mahon Arsenal." "The Future of the Torpedo." "Traditions of Seville."

MILITARY.

AUSTRIA-HUNGARY.—*Militär-Zeitung.* Vienna: 8th January, 1899.—"Signum Memoriæ." "1899." "The Maintenance of our Reserve." 16th January.—"The German Military Propositions." "Officers in the Greek Chamber." 24th January.—"The Command of Cavalry." "Increase of Pay."

Organ der Militär-wissenschaftlichen Vereine. Vienna. January, 1899.—Has not yet been received.

Mittheilungen über Gegenstände des Artillerie- und Genie-Wesens. Vienna: December, 1898.—"The Measurement of Distances for War Purposes." "Relations between the Qualifying Factors of Ballistic Equations and their Practical Realisation."

January, 1899.—"The Grouping of Zones of Fortresses, their Organisation and Composition." "How can the Efficacy of Shrapnel be Raised?" "The Repeating Small-Arm M 95 in Austria-Hungary."

BELGIUM.—*Bulletin de la Presse et de la Bibliographie Militaires.* Brussels: 15th January, 1899.—"War and National Economy." "English and Russians in Central Asia." "Study on Infantry Fire." 31st January.—"English and Russians in Central Asia" (*continued*). "Foreign Military Intelligence." "Study on Infantry Fire" (*continued*).

FRANCE.—*Revue de Cavalerie.* Paris: December, 1898.—"Letters of a Horseman." "Some more Words on Instruction." "Spain" (*continued*). "A

Study *raisonnée* of the Provisional Practical Instructions of the 24th December for the Service of Cavalry in the Field." "A Study on the Overriding of Horses."

January, 1899.—"Extended Order." "Spain" (*continued*). "Squad Instruction." "De Bautzen at Pläswitz, May, 1813." "The Price of Remounts." "Study on the Overriding of Horses" (*continued*). "Re-organisation of the School for Cavalry Officers at St. Petersburg."

Le Spectateur Militaire. Paris: 1st January, 1899.—"The War between the United States and Spain" (*continued*). "The Alpine Troops in France and Italy" (*concluded*). "After Fashoda" (*concluded*). "Recollections of an Infantry Marine Officer" (*continued*). "Meteorology as applied to Ballooning" (*continued*). 15th January.—"The War between the United States and Spain" (*concluded*). "Recollections of an Infantry Marine Officer" (*continued*). "Meteorology as applied to Ballooning" (*continued*). "Field Service in the Colonies."

Revue du Cercle Militaire. Paris: 7th January, 1899.—"The Japanese Army To-day and To-morrow." "The Increase in the German Cavalry." "Horsemen and Cyclists." 14th January.—"German Colonial Troops." "The Japanese Army To-day and To-morrow" (*continued*). "The Re-victualling of the Russian Army in the Field." 21st January.—"Exercises in the Crossing of Running Water" (with photographs). "Artillery Scouts." "The New German Military Law in the Reichstag." "The Assault of Geok-Tépe, 25th January, 1881." 28th January.—"The Battle of Omdurman" (with map). "Artillery Scouts" (*continued*). "The Re-victualling of the Russian Army in the Field" (*continued*).

Journal des Sciences Militaires. Paris: January, 1899.—"The Eve of Iéna." "Remarks on the Spanish-American War." "Military Ballooning in France and Abroad." "Study on the Instructions and Regulations for the Manœuvre of Field Artillery." "Scheme for the Regulation of Infantry Manœuvres." "Hygiene of the Feet."

Revue d'Artillerie. Paris: January, 1899.—"The *Matériel* (Model 96) of the German Field Artillery." "Instruction of Field Artillery in Germany with the Two Years' Service." "Essay on the Manner of Preparing the Cadres for Artillery Reconnaissance." "A Study on Pistols and Revolvers."

Revue Militaire de l'Étranger. Paris: January, 1899.—"The Philippines and the Insurrection of 1896-1897." "The Egyptian Expedition to the Soudan in 1898" (*continued*).

Revue du Service de l'Intendance Militaire. Paris: January, 1899.—Has not yet been received.

Revue du Génie. Paris: January, 1899.—"Military Geography and New Geographical Methods." "Introduction to Practical Exercises of Engineers in the Field." "Metal Boats in Austria-Hungary."

GERMANY.—*Internationale Revue über die gesammten Armeen und Flotten.* Dresden: January, 1899.—"Sanitary Service in the Battle-field." "From the Italian Army." "England in Chinese Waters." "The Grand French Manœuvres of 1898." "The Acquisition of the Fergana District on the part of Russia, and the Insurrection there of the Natives in May, 1898." "The Results of the War of 1897." "China and the Great Powers."

Jahrbücher für die deutsche Armee und Marine. Berlin: January, 1899.—"In the Days of Frederick—Frederick the Great and Lessing." "Schwarzenberg's March on Wolkowysk." "The Future War, from a Russian Professional Opinion." "Argentine Military Matters." "The Quarrel about Fashoda." "Army and Navy News from Russia." "Short Military Historical Notes." "A Russian Opinion on the Arming of Cavalry with Lances." "Telegraphy without Wire."

Neue Militärische Blätter. Berlin: November, 1898.—"Imperial Manœuvres on the Weser, 1898." "The War between Spain and the United States of North

America." "The Military Development of Japan since 1895." "Major-General A. W. von Thünn and his 23rd Infantry Regiment." "The Regiments of the Royal Prussian Army of the Year 1806." "Motor Cars for the Army." "The Devil amongst the Military."

December, 1898.—"The Real Significance of Independence for the System of Command in War—Gravelotte and St. Privat." "The Regiments of the Royal Prussian Army of the Year 1806." "The War between Spain and the United States of America." "Fashoda."

January, 1899.—"Military Propositions and the Two Years' Service." "From the Mediterranean to the Cape of Good Hope." "The Cable Question—New Telegraphic as well as Cable Communication." "The Means of Defence of the Smaller States of Northern Europe." "Madagascar and Delagoa Bay."

Militär-Wochenblatt. Berlin: 4th January, 1899.—"Criticism of the Russian Manœuvres." "The Battle of St. Privat." "Proposed Alterations in the Course of Instruction in Judging Distance." 7th January.—"Proposed Alterations in the Course of Instruction in Judging Distance" (with two sketches) (*continued*). "Military Service and Civil Employment." "Coast Defence and War-Ships." 11th January.—"Proposed Alterations in the Course of Instruction in Judging Distance" (*concluded*). "Military Service and Civil Employment" (*continued*). "Horse Artillery in a Cavalry Engagement." "The Army List of the Saxon Army for the Year 1899." "The Street Fighting in Milan from the 6th to the 10th May, 1898" (with one sketch). 18th January.—"The Efficiency of the German Garrison Artillery in the Work of Besieging, Bombarding, and Investing in the Franco-German War of 1870-1871." 21st January.—"Military Society in Berlin." "In the Days of Frederick." "The Development of the Army during the Five-and-Twenty Years from 1874 to 1898." "The Efficiency of the German Artillery in the Work of Besieging, Bombarding, and Investing in the Franco-German War of 1870-1871" (*continued*). 25th January.—"In the Days of Frederick." "The Development of the Army during the Five-and-Twenty Years from 1874 to 1898." "The Efficiency of the German Artillery in the Work of Besieging, Bombarding, and Investing in the Franco-German War of 1870-1871" (*continued*). 27th January.—"In the Days of Frederick." "Report on the Efficiency of the Empress Augusta's Association for German Daughters for the Year 1898." "When does the Nineteenth Century end?"

Deutsche Heeres-Zeitung. Berlin: 4th January, 1899.—"The Development of Krupp Field Artillery *Matériel* from 1892 to 1897." "The Battles before Belfort, January, 1871, and Historical Truth" (*continued*). 7th January.—"French Fortresses." "How has the Introduction of the Two Years' Service answered up to the Present with Foot Soldiers?" 11th January.—"On the Necessity of German National Education." "The German and Russian Navies in the Year 1903." 13th January.—"The Fashoda Affair." "The German and Russian Navies in the Year 1903" (*continued*). 18th January.—"The Pay of French Officers." "France's Shipbuilding Programme, and the Condition of Her Navy in 1903." "Armour-plate Experiments on the Remington Proving Ground of the Carnegie Company by the Bethlehem Iron Works, South Bethlehem, in October and November, 1898." "Peace Pictures." 21st January.—"French Opinion against Reduced Service." "The Battles before Belfort, January, 1871, and Historical Truth" (*continued*). "Peace Pictures." 25th January to the 27th January.—"The Battles before Belfort, January, 1871, and Historical Truth" (*continued*). "The Operations of the Wheeled Transport at the Manœuvres of the 8th and 13th French Army Corps in August, 1898." "Peace Pictures." 28th January.—"The Battles before Belfort, January, 1871, and Historical Truth." "The Operations of the Wheeled Transport at the Manœuvres of the 8th and 13th French Army Corps in August, 1898" (*continued*). "Artillery News from France."

ITALY.—*Rivista di Artiglieria e Genio.* Rome: January, 1899.—"On Our Mountain Artillery." "An Ideal Range-finder." "Pneumatic Tyres." "New Spring Locks for Baggage Trunks." "The Siege of Strassburg in 1870." "General Rohne's Field Howitzers." "The Fortified Girdle of Antwerp." "The Bergman and Browning Automatic Pistols." "The English 5-inch Field Howitzer."

Rivista Militare Italiana. Rome: 1st January, 1899.—"Luigi Blanch and the Evolution of the Science of War." "The Organisation and Times of Montecuccoli and Louvois" (*continued*). "The Roman Military Roads which pass by Florence" (*concluded*). "Politico-Military Notes." 16th January.—"The Battle of the Three Arms." "The Organisation and Times of Montecuccoli and Louvois" (*concluded*). "From Omdurman to Fashoda." "Politico-Military Notes."

SPAIN.—*Memorial de Ingenieros del Ejército.* Madrid: January, 1899.—Has not yet been received.

Revista Técnica de Infantería y Caballería. Madrid: 1st January, 1899.—"Our Regeneration." "Promotion and Pay." "The Supply of Ammunition to Infantry in a Modern Battle." "Our Generals." "Independent Cavalry in front of Water-Courses." "A Plausible Tribunal." 15th January.—"Promotion and Pay" (*continued*). "Independent Cavalry before Water-Courses" (*continued*). "The Supply of Ammunition to Infantry in a Modern Battle" (*continued*). "Our Generals" (*continued*).

RUSSIA.—*Voïénnyi Sbórnik.* January, 1899.—Has not yet been received.

SWITZERLAND.—*Revue Militaire Suisse.* Lausanne: January, 1899.—"Austrian Imperial Manœuvres of 1898" (with one map). "Crossing of the Pauix by a Battalion of Recruits of the 8th Division" (with two plates). "The *Rôle* of Artillery Scouts." "The New French Field Gun." "The Anglo-Egyptian Expedition to the Soudan in 1898."

NOTICES OF BOOKS.

Comment on Marche: Des divers modes de progression, de la supériorité du mode en flexion. By FELIX REGNAULT, formerly House Surgeon of the Paris Hospitals, and M. de RAOUL, Major of the 34th Regiment of Artillery. Demy 8vo. Paris, 1898.

Under the above title Dr. Regnault and Major de Raoul (of the French Artillery) have written a book which is certainly worth reading. The joint authors introduce a new system of marching called "en flexion," or bending the knees and body. M. Marey, the physiologist, who is convinced of the practical utility of this new method, has written an eloquent preface to the book in favour of it. Major de Raoul states that he has tried the system he advocates amongst the troops under his command with the happiest results, and says that they were able, after very little training, to do distances of 20 kilometres (or about 12½ miles) in 1 hour and 50 minutes, without fatigue. He draws attention to the fact that this way of walking is by no means a novelty, and is the natural one practised by professional walkers, mountaineers, sportsmen, and by soldiers when fatigued after a long march. Dr. Regnault, for his part, quotes his Indian experiences in favour of the "Marche en flexion," and maintains that the forward inclination of the body in walking naturally causes the leg to bend, and not to straighten itself out, as is now taught in military marching, and that this bending of the leg allows the foot to be placed gently on the ground, and without the shock that is inseparable from the straightened leg, and which shock, slight though it may be, impedes the marching. Both authors claim that the new style of marching gives greater

mobility to the infantry, and will be found invaluable in war-time by the troops that practise it, and without doubt, if the results are such as they assert the question is well worth earnest consideration. The book has several interesting illustrations of various methods of walking.

Infantry Tactics and Modern Weapons. Translated from the German, with a proposed adaptation of the author's scheme to the British Infantry attack. By P. H. Demy 8vo. Allahabad, 1897.

This most instructive pamphlet is, as the translator informs us, a condensed translation from the German. The author describes the attack system practised by European Armies, and explains how a system, to meet present requirements, may be evolved from them. The difficulty of control by company commanders, he admits, are very great and almost impossible in the present system of "skirmisher swarms," but that induces, as a compensation, to greater independence of action on the part of subordinate officers. The author strongly deprecates the "double" as a great mistake in the attack, and says that it "practically disarms the infantry," and he lays very great stress on the importance of having fresh troops ready for the final stage. He stigmatises the present system as "diseased and out of date," points out its defects, insists that extended order should be tactically organised, explains the main objects to be attained in evolving a system, and finally makes definite proposals for a new attack formation and the principles on which it should be based.

The translator shows, by the aid of three diagrams:—1. How the formations proposed by the author may be adapted to a company and a battalion. 2. A German battalion attacking on the proposed system. 3. The frontage and depth occupied by German and British battalions and brigades respectively. The whole pamphlet is full of interest and instruction, and should be carefully read to be properly appreciated.

Tactical Fitness for Command. By Major J. R. JOHNSTONE, Royal Marines. Crown 8vo. Portsmouth, 1898.

This pamphlet, as the author points out, consists of a few notes, gathered from his own experience and that of other officers, and are put together with a view of helping majors who may wish to present themselves for the test examination for second in command. Officers experience very great difficulty in finding out what to expect, and how to prepare themselves for the examination, and the object of this book is to show them how to do so. The book contains four schemes, taken from papers actually set at Aldershot, together with the necessary orders to each branch of the forces concerned. The work is altogether a most useful one, and should be of the very greatest assistance to all officers desirous of presenting themselves for the examination for promotion to second in command.

A Fleet in Being. By RUDYARD KIPLING. London, 1898.

The public have now for some years past been treated by special correspondents during the annual naval manœuvres to various descriptions, more or less interesting, of life on board H.M. ships, as it has appeared to them in their capacity of spectators; but it has been left to Mr. Kipling, in the little booklet before us, in which he describes two trips in a small cruiser with the Channel Squadron, to give us a vivid glimpse of the life on board and an insight into the real thoughts and conversation of officers and men, on the pressing questions of the moment. "A Fleet in Being" will appeal to and be read by all naval officers, no matter what their rank, with much pleasure and amusement, for where is the admiral or captain who in his day has not gone through all Mr. Kipling relates so well; who has not with mutiny at his heart had to make himself scarce from the gun-room when the fork appeared in the beam; who has not done his share in skilfully annexing some of Her Majesty's paint or other stores; or who has not

felt uncomfortable, when the flag-ship has kindly inquired in the morning for the name of the officer of the first or middle watch, as the case may be? It is a very real picture which the author gives, and very skilfully drawn. Mr. Kipling is to be heartily congratulated on his work, and we are glad to see that it is appreciated even by foreigners, as a very good translation of it has appeared in that important German naval periodical, the *Marine Rundschau*.

The Earl of Chester's Yeomanry Cavalry 1797-1897. By H. A. BIRLEY. Super Royal 8vo. Edinburgh, 1898.

Die Heere und Flotten der Gegenwart (Deutschland). Vols. 1 and 2. By von BOGUSLAWSKI and R. ASCHENBORN. Super Royal 8vo. Berlin, 1898.

China in Transformation. By A. R. COLQUHOUN. Demy 8vo. London, 1898.

The Spanish War 1585-87. By JULIAN CORBETT. Royal 8vo. London, 1898.

Home Defence. By Captain G. F. ELLISON. Crown 8vo. London, 1898.

Chaudières Marines. By J. B. GIRARD. Crown 8vo. Paris, 1897.

The Conduct of War. By Lieut.-General von der GOLTZ. Crown 8vo. London, 1898.

L'Armée de Bonaparte en Egypte 1798-99. By Commandant GUITRY. Demy 8vo. Paris, 1898.

Trial of Sir John Murray, Bart., by a Court-Martial. By W. B. GURNEY. Crown 8vo. London, 1815.

Backwards or Forwards. By Colonel H. E. HANNA. Crown 8vo. London, 1898.

Sketches on Service during the Indian Frontier Campaigns of 1897. By Major E. A. P. HOBDAY. Small Royal 8vo. London, 1898.

Reflections on the Art of War. By Brigadier-General R. C. HART, V.C., C.B. Crown 8vo. London, 1897.

The Swordsman. By ALFRED HUTTON. Crown 8vo. London, 1898.

Tactical Fitness for Command. By Major J. R. JOHNSTONE. Demy 12mo. London, 1898.

Wanderungen über die Schlachtfelder von Saarbrücken und Metz. By HERMANN KUNZ. Demy 8vo. Berlin, 1896.

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Hon. G. A. A. Hood	Grenadier Guards.
H. A. Leverson, Esq.	Royal Inniskilling Fusiliers.
Captain K. M. Davie	Gloucestershire Regiment.
Captain S. Jervis	South Staffordshire Regiment.
C. F. Romer, Esq.	Royal Dublin Fusiliers.
*Brevet-Major A. J. Godley	Royal Dublin Fusiliers.

*Specially nominated for admission to the Staff College.

The undermentioned Officers also qualified but there were no vacancies for them—

A. Symons, Esq.	13th Hussars.
Captain D. Arbuthnot	Royal Artillery.
*Captain J. A. S. Tulloch	Royal Engineers.
P. O. Hazelton, Esq.	Army Service Corps.

* Obtained FULL MARKS in one paper in Mathematics.

Places taken by the above Officers in the various subjects include—

MILITARY HISTORY—First, Second, Third (two), Sixth, etc.
MATHEMATICS—Second, Sixth, Seventh, Ninth and Tenth.
TACTICS—Third and Fourth.
FORTIFICATION—Third (four), Ninth and Tenth.
TOPOGRAPHY—Third, Fourth and Seventh.
FRENCH—First, etc.

PROMOTION.

Forty-Two Officers passed in 1898, raising the **total number** of our successes for this Examination to **Five Hundred and Seventy-Three.**

Officers have **Special and Individual Attention,** there being **No Large Classes.**

At the Examination in **November** last, **all passed.**

ARTILLERY COLLEGE, NOVEMBER, 1898.

The **only Officer** sent up **passed,** *i.e.*, R. A. S. Benson, Esq., Coldstream Guards.

MILITIA MILITARY COMPETITIVE, MARCH & OCTOBER, 1898.

Forty-Eight Officers were **successful.**

Our total successes at the last four examinations being **One Hundred and One.**

At the Examinations in December last, the following pupils were successful—

WOOLWICH.

42nd Infantry	C. S. Hunter	8777
53rd ,,	F. W. Hill	8411
54th ,,	J. H. Slade Powell	8390
63rd ,,	J. W. Renny-Tailyour	8048
65th ,,	A. C. Gunter	7978
72nd ,,	T. R. Fraser-Bate	7709
74th ,,	G. E. Smart	7626
85th ,,	G. K. Gregson	7266
—	R. Arnott	6560
Militia Artillery	F. E. Koebel	—

In July **Nine** Passed. The previous year **Eighteen** Passed, the **total being far in excess** of that obtained by **any other establishment.**

SANDHURST.

Last year **Forty-One** Passed.

In 1897, **Thirty-Three** Passed, the **total** being again **in excess** of that obtained by **any other establishment.**

MILITIA LITERARY, JUNE, 1898.

At this Examination more than 60 per cent. of the successful candidates were prepared by us, and the places in the different subjects include—

French—First, Second, Third and Sixth.
Mathematics—Second, Third and Fourth.
Geography—First and Second.
English History—First and Second.
Greek—Second, Third and Fourth.
Physics—First, etc.

Special and individual attention is given to Militia Officers who are backward in any subject, and qualifying marks, *i.e.*, 4,500 are invariably attained by our candidates.

THE ADVERTISEMENT DEPARTMENT OF THIS JOURNAL IS CONDUCTED IN J. J. KELIHER & CO.'S ADVERTISING OFFICES, 33, KING WILLIAM STREET, E.C., AND MARSHALSEA WORKS, BORO' S.E., WHERE ALL COMMUNICATIONS SHOULD BE ADDRESSED.